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Essential Fatty Acids in Infant Feeding[1]

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ALTHOUGH OVER five hundred types and brands of milk preparations are used in infant feeding (1), no food has been found to excel mother's milk for this purpose. In the words of Dr. Oliver Wendell Holmes, "No two cerebral hemispheres of any learned professor's brain is equal to two healthy mammary glands in the production of a satisfactory food for infants." The scientific reasons for the universally accepted superiority of human milk have not been forthcoming. Today, many workers place great emphasis on the advantage of breast feeding because of its role in strengthening the emotional ties between mother and infant; however, this phase of the subject is a little beyond the scope of our thesis here. Admittedly important in the past have been the factors of freshness and cleanness, but with advances made in the methods of preparation of cow's milk mixtures, the bacteriologic aspect has become less significant. Therefore, we shall attempt to discuss the problem from the nutritional point of view.

The universal practice of supplementation of cow's milk with sources of vitamins A and D readily dispels the possibility that inequality in vitamin composition could explain the superiority of one type of milk over the other. Likewise, lesser amounts of protein and minerals in breast milk could hardly account for its greater desirability as a source of nutrients for the growing infant. The widely accepted practice of dilution of cow's milk with water, plus the addition of diverse carbohydrates to bring the caloric composition in the same range as breast milk, tends to eliminate the type and amount of carbohydrate as being especially significant. As yet, factors such as antibodies, enzymes, or pigments have not been suspected as being particularly noteworthy, although little is known regarding their significance in infant feeding.

Inasmuch as the amount of fat in breast milk and in the usual milk mixtures given to infants differs relatively little, it is no wonder that fat has received little consideration in discussions concerning the relative merits of breast and artificial feeding. In fact, there has been a tendency to reduce the amount of fat in milk preparations used for feeding the young infant, especially the premature. The trend to decrease the fat content of milk given to infants has been influenced no doubt by statements of early pediatricians and nutritionists who believed that removal of fat from the diet did not influence the nutritional state of the infant. Although some attention has been given to differences in composition of the fatty acids between breast milk and cow's milk, especially with respect to the short chain fatty acids, these dissimilarities have been considered of little concern nutritionally. Scant attention has been given to differences in composition of the unsaturated fatty acids in milk in relation to infant feeding.

Infant Eczema and Fat Intake

The author's (2, 3) interest regarding the possible significance of unsaturated fatty acids in the infant's diet began with a clinical observation some years ago. A number of infants with eczema were benefited when fats, such as fresh lard and certain vegetable oils, were added to their diet. This seemed to be particularly noteworthy because at the time the accepted therapeutic procedure was to decrease the fat in the diet of the infant with eczema. Burr and Burr (4) had demonstrated that a dietary need existed in the rat for certain unsaturated fatty acids, and one of the distinct manifestations of the fat-deficiency syndrome they described was related to the condition of the skin.

With these facts in mind, further investigations were carried out in the laboratory on blood serum of eczematous and non-eczematous infants. It was found that the fatty acids of the blood serum of infants suffering from intractable eczema had lower iodine numbers than those of infants not having eruptions of the skin. The average iodine number of the fatty acids of the infants with chronic eczema was 84 in contrast to 111 for the control infants (2).

[1]Presented at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 23, 1957.

Studies with rats (5) had disclosed that the difference in degree of unsaturation of the serum fatty acids between fat-deficient and healthy control animals was of the same order of magnitude as had been found between eczematous and healthy infants. Coincidental with the clinical improvement following the administration of dietary fats containing unsaturated fatty acids to the infants with eczema, the iodine number of the serum fatty acids increased to the normal range (6). By no means did all infants with intractable eczema improve following the addition of fat to the diet; nevertheless, it did seem rather remarkable that such a large proportion responded favorably.

Studies on Serum Fatty Acids

It soon became apparent that measuring the iodine number of the fatty acids gave little exact information concerning the content of specific fatty acids. Consequently, it was felt that if progress were to be made in determining the significance of essential fatty acids in human nutrition, a method (7) for measurement of the unsaturated fatty acid composition of the serum would be required. In collaboration with Hilda F. Wiese, a series of studies (8-10) were undertaken with puppies which revealed that close correlations existed between dietary linoleic acid and (a) the clinical condition of the animals, (b) the histologic structure of the skin, and (c) the blood serum levels of the di-, tri-, and tetraenoic fatty acids of the serum. On the basis of these studies with experimental animals, it was believed that sufficient data had been gathered to undertake more comprehensive studies with human subjects.

To ascertain some idea of the normal values for the unsaturated fatty acids in human subjects, a study (11) of sixty healthy children three to fourteen years of age was made, wherein the values for the two, three, and four double-bond fatty acids were found to be 30.3 ± 0.28, 1.5 ± 0.62, 10.2 ± 1.44 per cent of the total fatty acids, respectively. The total fatty acid level of the serum was 30.1 ± 3.59.

Following these preliminary studies, a number of infants were fed various types of milk mixtures which are used in infant feeding. It was found that to a remarkable degree, the level of the di-, tri,- and tetraenoic acids of the serum reflected the linoleic acid content of the diet. Although rather extensive observations have been made on infants, the complete data as yet have not been analyzed. However, preliminary findings revealed that when the linoleic acid intake was very low, the di- and tetraenoic (linoleic and arachidonic) acids of the serum were very low, whereas the three double-bond fatty acid level was high compared to the findings in the infants who were given diets containing moderate to fairly large amounts of linoleic acid. This same phenomenon had been observed in the blood serum of dogs maintained on fat-deficient and control diets. For example, with an intake of linoleic acid equal to 0.10 per cent of the calories consumed, the values for di-, tri-, and tetraenoic acid, respectively, were 5, 16.5, and 4 per cent of the total fatty acids of the serum. In control animals receiving 29 per cent of their calories as fat (fresh lard), these values were 22, 2.1, and 22 per cent respectively. In infants, the increase in dienoic acid content of the serum was less rapid when the linoleic acid was administered as the ethyl or methyl ester than when given as the triglyceride, either as a supplement of trilinolein or as the natural fat in a milk preparation.

Relation of Fat Intake and Caloric Intake

In studying the infants, careful records of the food intake were made and their weights were determined daily. Close clinical supervision was maintained and routine laboratory tests were made periodically. When the weights and the caloric intake per kilogram body weight per day were fitted to straight lines, it was found that the low-fat diet was associated with an increased caloric intake while no special change occurred in the slope of the weight curve.

For example, one infant, two weeks of age, was given a skim milk mixture which was very low in fat (total fat equal to 1.0 per cent of the calories with linoleic acid 0.04 per cent). She was allowed to consume milk to her full satisfaction at each feeding. At the beginning, she was consuming about 110 calories per kilogram body weight per day, but the daily consumption gradually increased so that when she was six weeks old, her food intake was at the rate of about 160 calories per kilogram. An evaporated milk mixture (total fat constituting 40 per cent of the calories with linoleic 1 per cent) was then given. Both milk mixtures contained 20 calories per ounce. Almost immediately the infant was satisfied with a lesser food intake so that when she was ten weeks old, she was consuming about 110 calories per kilogram per day. The slope of the weight curves during each of the four-week periods was essentially the same. The average daily weight gain was 25 and 27 gm., respectively, for both the skim and the evaporated mixtures. This same type of observation has been made a number of times with remarkable uniformity regarding a greater food consumption when low-fat milk formulas were being fed.

Caloric Intake Related to Linoleic Acid

In the attempt to ascertain whether the difference in the caloric intake was due to fat itself or to linoleic acid, several infants were studied in a similar manner wherein the growth curves and caloric consumption per unit body weight were calculated when the infants were fed the skim milk mixture alone and again with supplements of linoleic acid. In a number of instances, it has been noted that caloric

intake per unit body weight was less when small supplements of linoleic acid, given as the methyl or ethyl esters or as the trilinolein, were added to the diet compared with that observed with skim milk mixtures alone. A rather extensive series of observations under various dietary conditions have been made, but the results are just now being compiled. It should be mentioned that this study was made possible by a contract from the Human Nutrition Research Division of the United States Department of Agriculture.

Scant attention has been paid to the difference in the linoleic acid content between cow's and mother's milk, the content of the latter being three to four times greater than the former. Study (12) of the two, three, and four double-bond fatty acids of different milk preparations and of the blood serum of infants given these milks disclosed that the dienoic acid content of the milk mixtures and serum values of the infants maintained on the milk corresponded remarkably. As to whether or not the linoleic acid content of breast milk with the corresponding high values in the serum of the infants consuming mother's milk contributes to the superiority of mother's milk as a food for infants is not known. That linoleic acid in part, at least, contributes to the good state of health of the breast-fed infant may be of more than coincidental significance.

Observations are now being made on a second series of infants who are being given cow's milk mixtures which contain various amounts of fat and linoleic acid.[2] Although still in the preliminary phase, nevertheless, the observation has been rather striking that very young infants having low-fat diets tend to develop definite changes in the skin (13). Although it will be some time before the study is completed, it is highly suggestive that linoleic acid plays a role in the maintenance of a healthy skin in infants.

[2]These milk mixtures are being prepared especially for study by Baker Laboratories Inc. of Cleveland. but the investigation is still very much in the preliminary phase.

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Characteristics of a Profession

What are the characteristics of a profession? Dr. Leon Mones, Assistant Superintendent in Charge of Personnel, Newark Board of Education, enumerated them for the New Jersey Dietetic Association in November:

(a) The members of a profession must demonstrate a strong will, pride in, and a never-ending desire to become a profession.

(b) Any profession must have a powerful organizational background with its own set of controls.

(c) There must be a continuing, deliberate, progressing background of research. Each member of any profession is duty-bound to continue studying.

(d) The profession must have a program of public interpretation and education. They must seek out effective methods of mass communication.

(e) Members of a profession develop loyalty to, discipline toward, respect, and acceptance of their professional leaders. "A profession rises as high only as the leaders get the followers to go."

Fatty Acids in Foods[1]

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TODAY WE find ourselves in the midst of one of the most challenging periods in the history of nutrition because of problems on the importance of fat in human nutrition. It appears timely to take stock of what is known about fats and fatty acids in foods to orient ourselves better on this phase of the subject in case we are called on to rechart the usual course we have pursued for many years.

In this summary, primary attention will be given to linoleic acid, as one important fatty acid now in the limelight of nutritional interest. Linolenic acid is low in most foods, and its nutritional role is uncertain. Arachidonic acid is chiefly of physiologic importance because so little of it comes directly from our foods. However, along with linoleic acid, one must consider saturated fatty acids and total fat in foods and also the nature of the diets which carry the fats and fatty acids.

Throughout this paper, I wish to emphasize that most of our dietary fat comes through foods selected for protein and other important values, not from the separated fats and oils; that much of the fat is in invisible form; and that some of the separated fats and oils are our main source of essential fatty acids. Although these facts complicate our problems, they must be kept in mind in planning modifications of diets.

Linoleic Acid in Foods

The content of linoleic acid in fats and oils varies widely from a mere fraction of 1 per cent in fully saturated fats to over 70 per cent in some seed oils. Figure 1 presents an overview of the distribution of this fatty acid in foods (1). It illustrates the approximate positions of some vegetable oils and animal fats in terms of percentage of linoleic acid in total fatty acids. In this paper, these percentages will be referred loosely to fats, although strictly they relate to percentage of total fatty acids. The values might be considerably lower in fats containing large unsaponifiable fractions.

Among common fats containing less than 40 per cent linoleic acid, one finds fats produced by ruminant animals—beef, lamb—running less than 5 per cent, by pork around 10 per cent, and poultry around 20 per cent. Few data are available on fish oils, and the unsaturated fatty acids are chiefly of the long-chain varieties about which we know little nutritionally. On the vegetable side of this chart, we find some tropical nuts and fruits below 10 per cent, and most other nuts around 20 per cent. It is clear that oils from plant sources vary widely. They range from about 2 per cent in coconut oil and cocoa

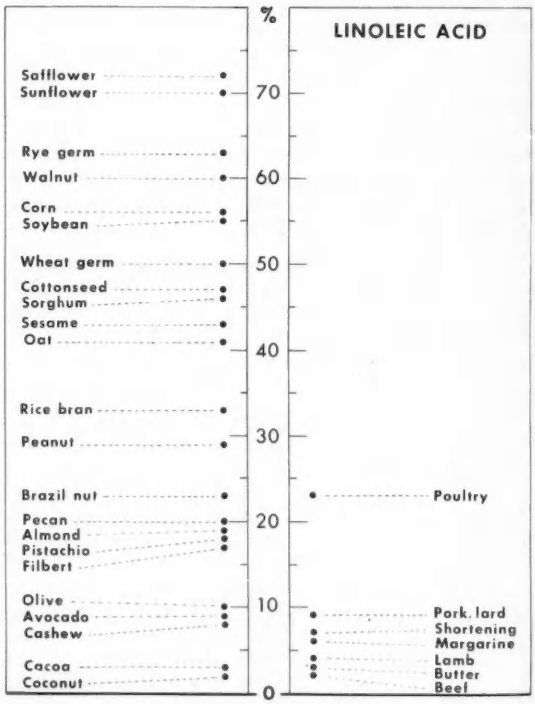

FIG. 1. *Percentage of linoleic acid in fats and oils of plant and animal origin.*

[1]Adapted from a paper presented at the Annual Meeting of The American Dietetic Association in Miami, on October 23, 1957.

butter, to more than 60 per cent in common oilseeds and grains. Nuts are positioned all the way up the ladder from less than 10 per cent to more than 60 per cent, but most seem to be in the range of 15 to 25 per cent.

The position of the grain oils is relatively high—rice, oat, wheat, corn, rye. If the early pioneer in this country who obtained a third or more of his calories from grains, consumed as much as a pound a day in whole grains—for example, whole wheat—he received about 9 gm. oil containing 4 to 5 gm. linoleic acid as well as vitamin E and some other essentials. Yet for over fifty years in this country, per capita consumption of grain products has been falling, and today little of the total is in the form of whole grains.

Many of the foods shown in this graph are not common items of diet. Even the major salad oils containing 40 to 60 per cent linoleic acid—corn, cottonseed, and soybean oils—have not always been available as separated oils for food. Most of the important dietary fats fall into two widely divergent groups when the quantity used is taken into account. Fats with less than 10 per cent linoleic acid comprise nearly 80 per cent of the dietary fats in the United States; at the other extreme of values, oils with 40 to 60 per cent linoleic comprise less than 10 per cent of the dietary fat. The remainder (about one-tenth of the fat) comes from miscellaneous sources with values in between 10 and 40 per cent linoleic acid. Most of them contain 10 to 30 per cent linoleic acid, the highest being the fats in poultry, peanuts, and some tree nuts.

From this overview, it is helpful to remember that peanut oil and olive oil are well below the class of other "salad oils," as we term them; and that coconut and cocoa fat (as in chocolate) are entirely out of the class of most vegetable fats and are comparable with the saturated fats from ruminant animals, both about 2 per cent. This overlapping range in characteristics shows that when reference is made to linoleic acid, animal and vegetable fats cannot be regarded as two distinct categories.

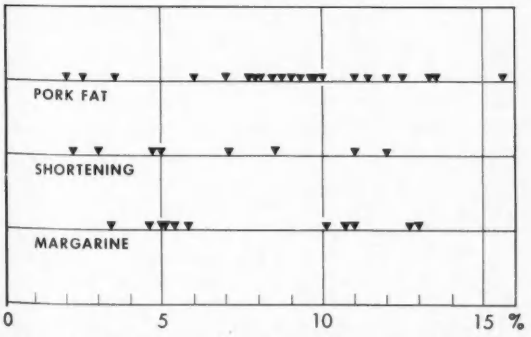

FIG. 2. *Variation in linoleic acid content of pork fat, shortening, and margarine.*

A most troublesome question at this time is the wide variation in values reported for many fats and oils. Some of these are shown in Figure 2 for animal fats which vary with the ration fed or with the location of depot fat in the body, and for plant oils which vary with variety or maturity, and still further with hydrogenation. The linoleic acid content of fat in pork as well as in poultry varies widely with the rations fed and may be much higher if the ration contains oilseed high in linoleic acid. Some differences are due to poor analytical methods, of course, and we cannot insist on more precise values until the chemists have developed more adequate methods. Values which have been used for this paper are from compilations of the best data accessible to us, but many must be regarded as only approximately accurate.

Iodine Value Not a Measure of Linoleic Acid

Iodine value is a convenient measure of total unsaturation in fats, but it is not a reliable measure of linoleic acid content because the mono-unsaturated oleic acid appears in large and variable quantities in most fats. For example, published data from one laboratory (2) shows a twofold range of iodine values from 88 to 140 for corn oil and a fourfold range in linoleic acid, with values from 16 to 68 per cent in individual samples, depending on the variety of the corn and other factors, mostly related to production. As might be expected when over half the oil consists of a polyunsaturated fatty acid, the statistical correlation with iodine value was high.

However, two oils each with an iodine value around 105 had 30 and 40 per cent linoleic acid, a difference of 10 gm. linoleic acid per 100 gm. oil; and two oils with an iodine value of 130 had 56 and 66 per cent linoleic acid, also a difference of 10 gm. linoleic acid per 100 gm. oil. Thus, the error in figures based on iodine values for even 10 gm. of

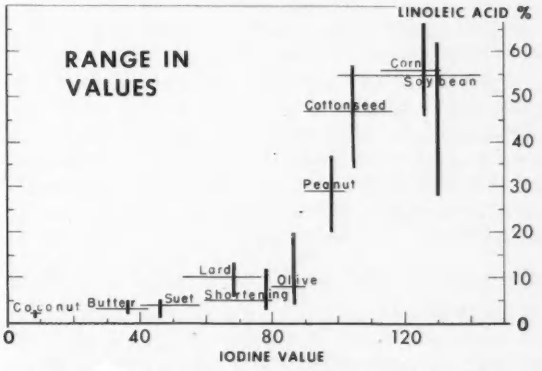

FIG. 3. *Relation of iodine value to linoleic acid content of typical fats and oils.*

TABLE 1 **U.S. food supply**

FOOD GROUP	PERCENTAGE OF CALORIES		
	1909—13	1935—39	1955
Milk products	10	11 →	14
Meats	20	20 →	24
Vegetables, fruits	10	10	10
Grain products	37 →	28 →	22
Fats, oils	11 →	15	15
Sugars, sweets	12 →	16	14

TABLE 2 **Household diets in U.S., 1955**

FOOD GROUP	FOOD ENERGY	FAT	LINOLEIC ACID
	%	%	%
Milk, cream, cheese	15	18	6
Meats, poultry, fish, eggs, legumes, nuts	26	42	38
Fats, oils	14	31	42
Fruits, vegetables	10	2	4
Grain products	25	6	9
Sugars, sweets	10	1	1

such corn oil can outweigh real values for as much as 50 gm. beef fat with a 2 per cent content of linoleic acid. For purposes of sound research, there is no alternative to analysis of the specific fats and oils being used in controlled experimental work.

Even if iodine value proves to have some useful application in clinical practice, we must keep in mind that it does not measure linoleic acid content alone. Although the degree of unsaturation may be roughly proportional to the content of linoleic acid, yet for research purposes, this assumption without analytical confirmation can lead to false premises. The relation to linoleic acid content is illustrated in Figure 3 for a number of common fats and oils (3). Ranges in iodine values are indicated by the horizontal lines and ranges in linoleic acid content by the vertical lines for the different fats.

There is a broad drift in iodine values up to 90 for many fats without appreciable rise in content of linoleic acid. This is due to increasing content of oleic acid. Then, with iodine values around 100, there are sharp increases in linoleic acid content of some fats without much increase in iodine value. For example, the iodine values of olive oil and peanut oil approach those of cottonseed oil, yet the linoleic acid content is only about one-fourth and one-half as much respectively. Linseed oil, which would be off the bounds of this chart, has an iodine value around 200, with a linoleic acid content of only about 20 per cent. The high iodine value of linseed oil is due to the high content of linolenic acid rather than oleic acid. Many fish oils would be off the iodine value limits of this chart due to unsaturated fatty acids which are neither oleic, linoleic, or linolenic.

Until nutritional research demonstrates the importance of dietary oleic acid and some other unsaturated fatty acids, we can become quite confused from relying on iodine value as a guide to content of essential fatty acids. We can become confused, also, by speaking of polyunsaturated fatty acids in foods when referring to linoleic acid alone.

Sources of Fats and Fatty Acids in Diets

With this brief review of the relative importance of individual foods as sources of linoleic acid, let us look at the importance of groups of foods as commonly consumed in this country. How do the amounts we eat affect the proportions of calories, fats, and fatty acids from different groups of foods? The figures in the tables are estimated, not analyzed values, and are subject to change when better data on fatty acids in foods become available. As most readers are aware, we have made considerable shifts in our choices of food in the last fifty years. The data in Table 1 are based on quantities of food supplies available at retail levels—the so-called disappearance figures, or economic consumption. These represent our best source of information on time trends (4).

Milk and meat consumption have changed appreciably only in the last two decades as indicated by arrows on the table. Although the over-all proportion of calories from vegetables and fruits has remained constant, there have been within this group notable downward shifts in the consumption of potatoes and upward shifts in citrus fruits. The most striking change apparent from these data is the continuing downward shift in consumption of grain products. The trend is not only in total amounts, as these data show—about 30 per cent decrease in fifty years—but over a longer period in this country, a shift from whole grain to highly milled, and lately more processed and ready-to-eat forms of grain products, with altered protein, fat, mineral, and vitamin content, even when they are enriched.

Data from household surveys on distribution of calories are similar to these from retail disappearance. In 1955, rounded figures for consumption by households in this country were: 15 per cent of the calories from milk products, 26 per cent from the meats group, 10 per cent from fruits and vegetables; 26 per cent from grain products, 14 per cent from fats and oils, and 11 per cent from sugars and sweets. Lower proportions from sugars and higher from grain products are due probably to ready-baked goods containing some of the sugar as they enter the household from retail markets. The combined values—grains plus sugars—were 37 per cent at retail, 36 per cent at household levels. Thus the figure of 22 per cent of calories from grains in 1955 is doubtless fairly indicative of our present level of consumption.

How do these same six food groups rate as sources of fat and linoleic acid? The figures for household diets based on data from the 1955 survey are shown in Table 2 (5).

The meats group made the largest contribution in fat, somewhat less in linoleic acid, and still less in food energy. In this table, the meats group includes eggs, dry beans and nuts, as well as poultry and fish. The nuts and poultry account for much of the linoleic acid. The fats-and-oils group contributed less than one-sixth of the food energy, twice as much of the total fats, and almost three times as much of the linoleic acid, due chiefly to the amounts of corn, cottonseed, or soybean oils included. The meats group and the fats-and-oils group are the two highest contributors of linoleic acid, but both are made up of foods with widely different contents of this fatty acid—for example, beef vs. poultry, or olive oil vs. cottonseed oil. Thus, if these broad groupings were used to appraise the fat characteristics of diets, it would be necessary to compute the fatty acid content of individual foods composing each of the two groups.

Problems in Lowering Fat Intake

The figures in Table 2 present some of our most difficult problems relating to fatty acids in diets—facts which must be faced realistically. For example, suppose it becomes necessary to curtail the amount of fat in diets. Recommendations have been made for some situations that diets should contain only 20 to 30 per cent of the calories from fat, instead of the 40 to 45 per cent prevailing in our present-day diets. This would mean cutting fats by one-third to one-half, or eliminating 30 to 50 points from the figures in Column 2 of this table. Eliminating the group of separated fats and oils as a whole might appear at first to be the simplest way, but one would thereby eliminate the richest source—nearly one-half—of the linoleic acid in our diet. By judicious selection, a part of this group of separated fats and oils—for example, the usual shortenings which comprise 10 to 15 per cent of the total fat—could be reduced without affecting appreciably the linoleic acid contribution of the group.

Then how about cutting some of the fat from meats? Of the average 42 per cent of fats which entered diets through the meats, poultry, and fish group, about 27 per cent was from the major meats—beef, pork, lamb, and veal. Some unpublished analytical data from our laboratories show that the fat from meats may be reduced by about one-half with close trimmings and discarding of the visible fat at the table. Thus, very close trimming could mean a reduction of perhaps 15 points of the 27 per cent, i.e., of the 42 per cent in Column 2. Some reductions would be possible through selection among dairy products, choosing the natural low-fat milks and omitting products in which the separated cream has been concentrated. Some reduction could be made by avoiding ready-to-eat prepared foods high in fat content. Even when all are taken together, it would be difficult to total 50 points. Any extreme reduction in fat intake would require elimination or drastic curtailment in consumption of some normal food items affording other essential nutrients, and this involves risk of deterioration in the over-all nutritional quality of the diet.

TABLE 3 Fat and fatty acids in household diets, 1955

FOOD GROUPS	FAT	SATURATED FATTY ACIDS	LINOLEIC ACID
	%	%	%
Milk, dairy products	25	39	8
Beef, veal, lamb	14	17	2
Subtotal	39	56	10
Pork, bacon, lard	24	23	23
Margarines, shortenings	13	7	9
Subtotal	37	30	32
Oils, salad dressings	6	3	28
Poultry, fish, eggs	6	5	7
Bakery goods, nuts, fruits, vegetables	12	6	23
Subtotal	18	11	30

Let us consider further the third of our dietary fat which comes from separated fats and oils as shown in this table. If further nutritional research should demonstrate the advisability of modifying the chemical nature of the fats in the American diet—for example, by enriching with linoleic acid or improving the ratio of linoleic to saturated fatty acids—this group of separated fats and oils would lend itself to modification. Of this 31 per cent, nearly 6 points were for shortening, 6 points lard, 7 points margarine, and 7 points butter, each of which could be modified during processing. The fats coming from other food groups shown are less accessible for modification.

Food Groupings for Fatty Acid Content

The food groupings shown in Tables 1 and 2 have proved practical for summarizing food consumption data for many nutritional purposes and can be used for fatty acids when calculations are made on individual foods throughout. However, they do complicate any short-cut approach to appraisal of fats in diets. A shifting of some items to give a more logical grouping of foods, such as that shown in Table 3, is needed for a practical guide in planning and rapid evaluation of diets.

Current and future dietary studies relating to fat in nutrition should retain at least these seven groups in summarizing data on quantities of fat eaten, even though combinations may prove feasible later. The first five groups afford a convenient basis

for exchange values relating to the kind of fat wanted for therapeutic diets. The first two groups are fairly parallel in proportions of fat and fatty acids contributed to 1955 diets—about five times as much saturated as linoleic. However, they should be kept separate in summarizing data on dietary intake in case the short-chain fatty acids, such as those high in milk fat, prove to be nutritionally important.

The third and fourth groups, pork fat and shortenings, tend to run parallel in the three characteristics shown here, but will have to be considered as two separate groups if hydrogenation of fat proves to be an important factor in human nutrition.

The contribution of oils and salad dressings is unique for the group's high ratio—nearly ten times as much linoleic acid as saturated fatty acids. These figures would differ if olive oil or peanut oil were prominent among the oils, since here they represent less than 5 per cent of the total. The last two groups differ from each other more than the first two pairs. The poultry-fish group makes only a small contribution to any of the three characteristics shown.

The last group is truly miscellaneous, and if the make-up of a diet differs much from the average for the United States, some items should be computed separately. Individual foods in this group carry fats containing from 2 to 70 per cent linoleic acid (cocoa fat to walnuts), but the usual consumption of some foods with extreme values is small indeed. The most common foods in the group range from 10 to 25 per cent linoleic in the fat. When the fat contents of the various foods in the baked goods, nuts, fruits, vegetables, and sweets are used, along with average consumption of each, for weighting an over-all value for this sub-group, the linoleic acid content averages about 10 to 12 per cent of the fat. The group value is altered only slightly by the inclusion of poultry, fish, and eggs because the quantity of fat from these is relatively small. However, for diets of those who consume appreciably more or less of some items, such as poultry, nuts, or whole grain products, than is characteristic of American diets, computations should be made separately for at least these unusual items.

The nuts within this miscellaneous group present a special problem because they contribute about one-fourth of the linoleic acid in the group, yet the fatty acid values of nuts differ widely as shown in Figure 1. Moreover, nuts often are sold and served in varied mixtures. Using the best linoleic acid values available for the different tree nuts, including walnuts, and the figures for national consumption of each, an average weighted value of 25 to 30 per cent linoleic acid is derived for the group. Since peanuts also fall in this range, one value may be used for all "nuts" wherever the assortment approaches the average supply in the United States. If the nut mixture is low in walnuts, a group value of 15 to 20 per cent linoleic acid or below may be better. If the nuts consist largely of cashews or other nuts which contain less than 10 per cent linoleic acid, or largely of walnuts with over 60 per cent linoleic acid, then obviously, the fatty acids in nuts should be computed separately rather than as a group.

The groupings can be greatly simplified, as shown in the subtotals of Table 3, if nutritional research does not compel us to give attention to the ratio of linoleic acid to saturated fatty acids, to the other unsaturated fatty acids, to the short-chain fatty acids, or to the unnatural isomers resulting from hydrogenation of fats. We can be fairly certain of the content of saturated fatty acids and of linoleic acid content in the first three of these combined groupings. Thus fats from ruminant animals furnished over 55 per cent of the saturated fatty acids and only 10 per cent of the linoleic, a ratio of more than 5 to 1. The combination of pork fat, margarine, and shortening furnished around a third of the total fat and slightly less of each type of fatty acid. The last two groups together furnished nearly 25 per cent of the fat, but less than 15 per cent of the saturated fatty acids, along with nearly 60 per cent of the linoleic—a ratio of 1 to 4, which is practically the reverse of the assortments in fats from ruminant animals.

Linoleic Acid Content of Food Groups

In general, on the basis of data from the 1955 study of food brought into kitchens in the United States, it is estimated that the average linoleic acid content of all dietary fats was about 10 per cent. The average figures are as low as 8 per cent if fatty acid values on the low side are used, and as much as 12 per cent if values on the high side are used to calculate the diets. When foods were classified into the four combined groups shown in Table 3 and linoleic acid content weighted by the 1955 patterns of food consumption, the foods in the simplified groupings are estimated to have the following linoleic acid content per 100 gm. fat or oil:

Simplified grouping	Linoleic acid content (1955 food choices)
	%
Milk, dairy products; beef, veal, lamb	2 to 4
Pork, bacon, lard; margarine, shortening	7 to 9
Oils, salad dressings	47 to 50
Miscellaneous (other foods)	10 to 12
Average household diet	8 to 12

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

William McKim Marriott—March 5, 1885–November 11, 1936

After 1930, for many years the standard text on infant nutrition was that of William McKim Marriott, whose first love was biochemistry and who later entered upon a pediatric career, somewhat by chance, or perhaps as a logical development from his knowledge of science. He was the man who helped to change the picture of infant mortality so common in the first decades of this century.

William McKim Marriott was born in Baltimore on March 5, 1885, the son of Reverend James Hamilton Wilson Marriott and Lucretia E. Williams. His achievements were many, but most noteworthy was his contribution to pediatrics and the science of infant nutrition. The principles of infant feeding that he taught became the generally accepted method for medical practitioners all over the country, and pediatricians from abroad came to study with him.

A minister's family provided no means for a college education, but Marriott was determined and resourceful. He spent his summers as a guide in the woods of Canada and thus earned enough to finance his college education each year. He obtained his B.S. degree (1904) from the University of North Carolina, where he developed his love of chemistry; his medical degree was obtained from Cornell in 1910. He then went as Instructor in Biochemistry to the Medical School of Washington University in St. Louis, where Phillip Shaffer and Walter Bloor were organizing a department of biochemistry. Marriott's interest in biochemistry developed along lines which required patients and especially children for him to work with, so he went (1914) to Johns Hopkins as an associate of Dr. John Howland. He remained with Howland for four years and developed many methods of analysis and tests for use in clinical studies. He also discovered that low serum calcium was associated with tetany in children. In 1917 he returned to Washington University as Professor of Pediatrics and continued his brilliant clinical work. He made contributions on alimentary intoxication in infants and gave the name "anhydremia" to the condition of dehydration which he found caused a reduction in blood volume.

Marriott's important work was in infant feeding. "There are numerous ways in which infants may be fed successfully and there is no one method of feeding or type of food which is to be recommended to the exclusion of others," he wrote. He recommended evaporated milk as the most practical and safe source of milk, and corn sirup as an inexpensive source of carbohydrate. *Infant Nutrition* was published in 1930, and after his death, the third and succeeding editions were kept up to date by Philip C. Jeans.

At the age of thirty-eight, Marriott became Dean of the Medical School at Washington University and held this position until 1936, when he went to San Francisco to be Dean and Professor of Medicine at the University of California. However, he lived only six months after accepting the new position. He died while still in the prime of life, on November 11, 1936, from an infection following an abdominal operation.

Marriott was a man of simple tastes who lived only for his work. He had a brilliant mind, high intellectual integrity, and a rare ability to apply clinically the results of basic scientific research. An active man, large in stature and with a terse, abrupt way of speaking, he was shy and not easy to know, but was respected by his associates. He was optimistic and confident in his own ability, work, and plans. In 1911, Marriott was married to Elizabeth Robinson. They had a son and a daughter.

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Nutritional Research in Atherosclerosis—A Progress Report[1]

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THE DISCOVERY several years ago that formula diets containing certain vegetable oils as their source of fat could appreciably lower serum cholesterol levels struck with considerable impact. This finding has been amply confirmed in our own laboratories and elsewhere. However, it is still not clear why vegetable oils have this cholesterol-lowering action, nor has the information gained from well controlled formula feeding experiments been adequately translated into practical dietary terms. Unlike the so-called reference pattern of amino acids that purports to describe optimal biologic value, there has been uncovered no reference pattern of fatty acids for the normal diet that can be considered optimal from the standpoint of cholesterol levels.

If one were to judge by the degree of interest that has been aroused in the subject, it might be said that considerable progress has been made in the atherosclerosis field during the past year. In addition, more than half a dozen new pharmaceutical preparations have been placed on the market in recent months, all of them claiming to lower the serum cholesterol level more or less painlessly. I say "more or less" because these products are quite expensive and not necessarily palatable.

Unfortunately, neither widespread publicity nor new products can compensate for the lack of basic and quantitative knowledge that still exists about the postulated relationship between diet and atherosclerosis. Although the solution may seem closer at hand, the problem remains unsolved.

Specifically, what have we learned during the past year or two and what are the important questions that still need to be answered? I should like to raise a few of the questions that seem pertinent and discuss briefly some of the information that is currently available about each one.

Role of Linoleic Acid

First, we know that the essential polyunsaturated fatty acid—linoleic acid—is assumed by many to play a major role in the diets known to lower the serum cholesterol. Has such a role for linoleic acid actually been established?

To date, this question has not been satisfactorily answered. Ahrens and his associates (1) at the Rockefeller Institute Hospital in New York have shown that the cholesterol-lowering effects of various test fats and oils can be related to the fatty acid composition of the fats by a formula that takes into account both the linoleic acid content and the total iodine value of the fat. Ahrens *et al.* have shown that if the factor representing linoleic acid content is left out of the equation, the data fit the simplified calculation just as well. Thus, they have suggested that the effect of dietary fat on serum cholesterol is perhaps more a function of mean unsaturation of the fat rather than the content of any specific acid, such as linoleic acid.

In cooperation with Dr. R. Clancy of the Veterans Administration Hospital in West Roxbury, Massachusetts, Dr. L. Sinisterra and I, and our associates (2) of the Department of Nutrition at Harvard have carried out formula feeding experiments in man designed to throw further light on this matter. We compared the effects on serum cholesterol levels of (a) a formula diet containing 40 per cent triolein (a synthetic oil virtually free of linoleic

[1]The researches described in this paper that have been done in the Department of Nutrition, Harvard School of Public Health, have been supported in part by a series of grants from the National Institutes of Health, Albert and Mary Lasker Foundation, John A. Hartford Memorial Fund, The Nutrition Foundation, Inc., and Fund for Research and Teaching of the Department of Nutrition, Harvard School of Public Health. Presented at the 40th Annual Meeting of The American Dietetic Association in Miami on October 23, 1957.

acid) and (b) a formula diet containing olive oil as the fat source. These two oils were similar in iodine value, but the olive oil contained 11 per cent linoleic acid. Thus, it was interesting to find that triolein formula diet did not lower serum cholesterol and, if anything, frequently raised it above control values; however, the olive oil formula diet induced a significant depression of serum cholesterol. Unfortunately, the synthetic triolein that was used contained abnormal isomers of oleic acid which were not present in the olive oil preparation. However, these preliminary experiments suggested that iodine value is not necessarily the crucial factor in determining whether a given oil incorporated into a diet will lower the level of serum cholesterol.

Are there then other constituents of plant oils that could lower serum cholesterol levels? Beveridge and his associates (3) in Canada have held that in the nonsaponifiable fraction of corn oil there reside sterols or other substances responsible for a considerable degree of the hypocholesteremic effect of this oil. On the other hand, Ahrens and his group (1) have shown that the removal of 80 per cent of the nonsaponifiable material, such as sitosterols, carotenes, and tocopherols, from corn oil failed to influence its cholesterol-lowering properties.

Hashim *et al.* (4) of the Harvard-West Roxbury group have recently supplemented low-fat diets with capsules containing 86 per cent cis-cis linoleic acid. When such capsules were administered in amounts that added approximately 20 gm. linoleic acid to the diet, serum cholesterol levels showed a drop. This particular linoleic acid concentrate was of interest because it was free of nonsaponifiable material. It is also worth recalling that a number of experiments have shown that when hydrogenated oils are fed as part of a controlled regimen, cholesterol levels are higher than when the same oil is fed in unhydrogenated form (5). In such experiments, it is primarily the concentration of polyunsaturated fatty acids that has changed, not the sterol content.

Will some specific amount of linoleic acid added to an ordinary American diet significantly lower serum cholesterol levels?

Hashim *et al.* have attempted to throw light on this question by giving subjects on constant "normal" diets concentrated supplements of linoleic acid. They found that as much as 25 or 35 gm. linoleic acid per day added to such diets did not necessarily induce appreciable drops in serum cholesterol levels, although some patients displayed a transient lowering of serum cholesterol when the linoleate supplement reached a level of 20 gm. per day. More consistent results were obtained when the linoleate supplement was fed to subjects on diets relatively low in fat (that is, 25 gm. per day). These results are still too preliminary to warrant the making of quantitative recommendations; however, they suggest that a more or less concentrated linoleic acid supplement added to a regular American diet will not solve our cholesterol problems (Table 1).

TABLE 1 **Linoleic acid content of pharmaceutical supplements compared with several natural food products**

PREPARATION	LINOLEIC ACID	CALORIES
	gm./15 gm.†	
#1*	6.8	90
#2*	6.9	95
#3*	4.5	70
Safflower oil	11.0	135
Corn oil	8.4	135
Walnuts	7.6	100

*Commercially available pharmaceutical products.
†15 gm. = 1 Tbsp.

Mechanism in Lowering Serum Cholesterol

If linoleic acid is considered to be the constituent in vegetable oils primarily responsible for their hypocholesteremic effect, what is the mechanism?

In regard to this question there has been considerable speculation but not much solid experimental evidence. As I pointed out last year (6), it appears that cholesterol normally esterifies mainly with polyunsaturated fatty acids. It has been argued that in the absence of an adequate supply of essential fatty acids, cholesterol would tend to esterify with saturated fatty acids. Such esters might be more difficult for the body to dispose of and might tend to accumulate in the blood and vascular tissues. There is now evidence against the idea that such saturated esters selectively deposit in blood vessels (7). However, the possibility exists that, as the proportion of unsaturated cholesterol esters decreases, the absolute level of serum cholesterol will increase. Many laboratories are now studying the essential fatty acid content of cholesterol esters in normal subjects and a variety of patients, including patients with hypercholesteremia. It should be mentioned that several years ago, Hammond and Lundberg (8) performed limited studies on the polyunsaturated fatty acids in the sera of patients with known atherosclerosis, clinically normal individuals, and Guatemalans on a diet exceedingly low in fat. The atherosclerotic individuals had diminished levels of polyunsaturated fatty acids with two and four double-bonds, as compared with normal North American subjects and, surprisingly, Guatemalans.

Where Does Cholesterol Go?

When the serum cholesterol level is lowered by means of diets high in essential fatty acid content, what happens to the cholesterol that has disappeared from the blood? Does it become deposited in the tissues of the body or is it excreted?

This question has not been answered with finality; however, there are indications from several different laboratories that when such cholesterol-lowering diets are fed, the fecal excretion of cholesterol and its end products is increased. Hellman and associates (9) injected C^{14}-labeled cholesterol into a patient with hypercholesteremia. They found that when the patient's regular diet was changed from an *ad libitum* one to a 40 per cent butter oil formula, plasma cholesterol rose from 478 to 720 mg. (net gain, 7.2 gm.) and, during the same time, fecal excretion of cholesterol and its end products decreased by at least 5.4 gm. When the butter diet was replaced by an isocaloric corn oil formula, cholesterol in the blood fell from 720 to 340 mg. per 100 ml. (a net loss of 11.4 gm.), and fecal excretion of cholesterol increased by a minimum of 9.6 gm. Brock and his group (10) in Capetown also found increased excretion of cholesterol and related sterols in the feces of subjects fed diets supplemented with vegetable oils rich in linoleic acid.

Although evidence is accumulating that fecal excretion of cholesterol usually increases when essential fatty-acid diets are fed, the detailed steps of this process are not yet known. Whether the vegetable oils interfere with cholesterol reabsorption from the gut, or whether they primarily promote excretion of cholesterol and its products into the gut cannot be determined from experiments reported to date. It is likely that the mechanism involved will be much better understood before long since a number of laboratories are now using isotope-labeled cholesterol in an attack on this problem.

Application of Present Knowledge

To what extent can we use the results from formula-feeding experiments in planning practical diets for the lowering of serum cholesterol levels?

Actually, it is rather difficult to apply knowledge obtained from formula-feeding experiments in composing practical cholesterol-lowering diets. First, the formula diet is a highly purified and artificial mixture that bears virtually no resemblance to normal food; second, it is still difficult to interpret many of the results obtained with such experiments. Take, for example, the results obtained by Sinisterra *et al.* (2) with formula diets containing olive oil as the fat source. With this preparation we were able to induce effective lowering of serum cholesterol levels in patients, even though the linoleic acid content of olive oil is only about 11 per cent. At the same time, regular diets containing 11 per cent of the fatty acids as linoleate do not appear to have cholesterol-lowering properties; indeed, the normal American diet accused of being atherogenic ordinarily contains a higher proportion of essential fatty acids than this (11). Of course, the fatty acid spectrum of olive oil does not resemble that of the normal diet. For example, olive oil has a very high proportion of the mono-unsaturated fatty acid, oleic acid.

Sinisterra and colleagues (2) also studied the effect of formula diets containing mixtures of coconut oil and safflower oil on serum cholesterol levels in man. As you know, coconut oil is highly saturated and poor in linoleic acid, whereas safflower oil is very rich in this material, containing 72 or more per cent linoleic acid. Hence, it was something of a surprise to discover that a half-and-half mixture of these two oils incorporated into the standard formula diet frequently was less effective than olive oil in lowering serum cholesterol levels.

These preliminary experiments are cited only to emphasize again that the effect of fats on serum cholesterol is not a simple matter of their content of linoleic acid any more than it is a matter of their iodine value. The whole spectrum of fatty acids in a diet influences the responsiveness of the serum cholesterol to any given level of linoleate intake. Specifically, the chain length of the other fatty acids may be important as well as the relative proportions of fully saturated and mono-unsaturated fatty acids (Fig. 1).

Protein-Fat Relationships

Nor can we exclude the role of protein from this picture. Recently Olson and his associates (12) in Pittsburgh have shown that a decrease in the dietary intake of protein from 100 to 25 gm. per day can be associated with a significant decrease in serum cholesterol, even if an appreciable proportion of the fat consumed at the same time comes from animal sources. I shall refer to the part played by carbohydrate in this picture subsequently.

Has any success in lowering serum cholesterol levels been obtained by means of diets composed of common foods but which provide a relatively high proportion of essential fatty acids?

There is little doubt that vegetarian diets (which

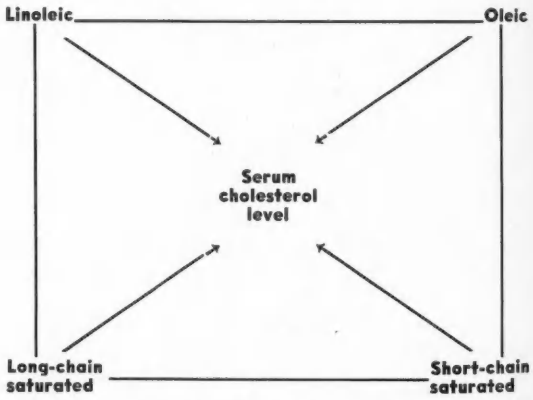

FIG. 1. *Dietary fatty acids that can affect the serum cholesterol level.*

tend to be rich in essential fatty acids) can lower the serum cholesterol level significantly. However, such diets differ from ordinary "omniverous" diets in many more respects than their fatty acid composition; for example, they differ in bulk, quality and quantity of protein, type of carbohydrate, and in mineral and vitamin content. Accordingly, it is rather difficult to be sure that the cholesterol-lowering effects of vegetarian diets are primarily attributable to the essential fatty acids they provide. Even if a regular diet has been modified less drastically in order to increase the essential fatty acid content, the consumption of such diets inevitably involves eating less of saturated fats (and perhaps of short-chain fatty acid) as well as more of linoleic acid. The effect of lowering intake of saturated fat always must be distinguished from the effect of raising the intake of unsaturated fats.

We have had a modest success in the prescription of essential fatty acid-rich diets and, remember, this involves curtailing the animal-fat intake as well. The inability of many patients to follow the prescribed diet—either for psychologic or monetary reasons—constitutes a major stumbling block in the majority of cases. However, in those few patients who have cooperated faithfully, we have observed an appreciable fall in the serum cholesterol level when approximately 25 per cent or more of the fat consumed consists of linoleic acid (Table 2).

As you well know, diets of this sort entail exclusion of visible animal fat from the diet with emphasis on the intake of fish, shellfish, nuts, olives, mayonnaise, and the consumption of a vegetable-oil supplement, such as corn or safflower oil. Ordinarily, such a regimen represents a major change in the patient's eating habits and requires considerable motivation on his part. Significant drops in serum cholesterol are obtained by such diets but not to the degree obtainable by formula feedings.

Increasing Linoleate Content of Foods

It may be asked whether there are not less arduous ways of lowering the serum cholesterol by diet.

Unquestionably, a number of common foodstuffs can be modified so as to increase their content of linoleic acid appreciably without changing taste or appearance. Vegetable oil can be homogenized with skim milk to produce a palatable whole milk. Ice cream and certain cheeses can be made with vegetable oils rather than butterfat, and a spread resembling butter can be manufactured that is rich in linoleic acid. Chickens, if fed a diet rich in essential fatty acids, will produce eggs whose yolks contain a high proportion of polyunsaturated fatty acids.

TABLE 2 Effect of a "regular" diet rich in linoleic acid (24 per cent of fat as linoleate) on serum cholesterol in a forty-nine-year-old patient with coronary atherosclerosis

WEEKS	MEAN TOTAL SERUM CHOLESTEROL
	mg./100 ml.
Control	280
3	244
6	206
9	224
15	201

All these things are within our technical grasp—the point is, we still do not have a pattern of fatty acids that we can refer to as being optimal for human health. For that matter, it is not known what effect diet-induced lowering of serum cholesterol will have on health. Preliminary indications from our laboratories, as well as from other groups, suggest that such diets followed for a matter of months may provide symptomatic relief in certain patients with coronary atherosclerosis. Such results are too scattered and too poorly controlled to be interpreted at this time. However, diets of this kind might well be given a trial in patients with elevated levels of serum cholesterol and particularly those with clinically manifest atherosclerosis, on the grounds that such therapy will do no harm and may do some good.

Assumptions Challenged

During the last year, certain assumptions about atherosclerosis have been subjected to critical reexamination. For example, Lew (13) has analyzed statistical data purporting to show that the death rate from coronary artery disease has increased strikingly in the United States in the last two decades. He has shown that 80 per cent or more of the apparent increase can be accounted for by such extraneous factors as the change in nomenclature for reporting deaths initiated in 1949, an increasingly larger population of middle-age individuals, better methods for diagnosing coronary artery disease, and a greater alertness to the disease. Thus, although atherosclerosis is still the prime killer of American males, the rate at which mortality from this disease is increasing is less alarming than the crude statistics appear to indicate.

Another assumption that has gained wide acceptance in recent years is one based largely on the extensive epidemiologic studies of Keys and his coworkers; namely, that the death rates of the various populations of the earth correlate well with the per capita quantities of fat consumed by such populations. Recently, this concept has been challenged by a number of authors including Yerushalmy and Hilleboe (14), who have pointed out that certain countries, such as the Netherlands, do not fit into the pattern of Keys' generalization.

After Sinclair (15) wrote his provocative letter to the *Lancet* last year postulating a relationship

between essential fatty acid deficiency and a variety of disorders ranging from lung cancer and leukemia to atherosclerosis, much lively correspondence on the subject appeared in this venerable journal and a great deal of heated discussion was heard among nutritionists. None of this verbiage has confirmed or refuted Sinclair's hypothesis; however, some information on this topic is available from experimental studies. Of interest is the report of Tuna, Reckers, and Frantz (7) describing the results obtained from analysis of the fatty acids of atherosclerotic plaques. These workers attempted to test the hypothesis that the saturated fatty acids, by virtue of their relative insolubility, may deposit preferentially in the arterial wall. Their analyses showed that the fatty acid spectrum of the total lipides of plaques taken from autopsy material is very similar to that of serum. These investigators believe that the highly unsaturated fatty acids can participate in plaque formation just as well as the saturated fatty acids.

In view of Sinclair's notion that the relative hypercholesteremia of North Americans and certain Europeans is caused by a deficiency of essential fatty acids, it is interesting to observe that subjects who have consumed linoleate-rich formula diets for many months display a prompt rise in serum cholesterol levels when they are returned to a regular diet. Such a rise occurs even if the linoleate content of the plasma lipids remains high (4). Obviously, such individuals cannot be suffering from an essential fatty acid deficiency as we currently understand this term, and the presence of extra polyunsaturated fatty acids in serum and depot lipids does not seem to protect such individuals from a rise in cholesterol levels as soon as they increase their intake of saturated fats. It appears that the serum cholesterol level is affected more by the current intake of fatty acids than by the quantities of essential fatty acids stored in the body.

Although interest in fatty acid metabolism continued to dominate research in atherosclerosis during the past year, other approaches to the problem have not been neglected. There is not enough space to enumerate the many interesting leads that have been uncovered. However, special mention should be made of the work of Hellerstein *et al.* (16) on rats fed cholesterol and cholate showing that when the magnesium content of the diet is increased, the animals are protected to a marked degree against atherosclerositic changes, even while the serum cholesterol level remains high.

Working at the level of intermediary metabolism, Siperstein and Fagan (17) in Texas have shown that the rate of cholesterol synthesis in cells may be in part controlled by the relative amounts of glucose metabolized via the so-called hexose monophosphate pathway of glycolysis. Thus carbohydrate metabolism has again been implicated in this complex problem. These developments make us realize that we cannot afford to confine ourselves to the paths of research that happen to be fashionable at the time.

Summary

It has been amply confirmed that formula diets and "low-fat" diets, supplemented with certain vegetable oils, can lower serum cholesterol levels. Apparently, such diets act by promoting increased excretion of cholesterol and its end products in the feces.

Although linoleic acid (or arachidonic acid) seems necessary for this hypocholesteremic effect, the degree of responsiveness of the serum cholesterol to an increased linoleate intake appears to depend on the nature of the other fatty acids consumed at the same time. Unfortunately, not enough is known about the interrelationships between the various fatty acids as they affect cholesterol balance to permit formulation of a fatty acid "reference pattern."

There is as yet no acceptable evidence to support Sinclair's notion that atherosclerosis is a manifestation of essential fatty acid deficiency, at least as the term "deficiency state" is ordinarily understood. Serum cholesterol levels seem to be more affected by the fatty acids currently consumed in the diet than by the quantities of essential fatty acids stored in the body.

During the past year, certain assumptions about the incidence of atherosclerosis in relation to fat intake and about the death rate from this disease have been critically re-examined. When appropriate corrections have been made in the statistics, the rate at which mortality from this disease is increasing becomes considerably *less* alarming. Also, certain inconsistencies have been noted in epidemiologic data purporting to relate incidence of atherosclerotic heart disease to total intake of fat. These inconsistencies again emphasize that further epidemiologic work is badly needed.

Finally, the preliminary clinical results obtained with cholesterol-lowering diets in patients with atherosclerotic heart disease are too limited and uncontrolled to interpret at this time. Nevertheless, the use of such diets seems warranted in selected cases since there are theoretic grounds for believing that clinical benefit may ensue.

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Fats and Hypercholesteremia

Numerous studies have demonstrated an effect of the amount and kind of fat on the level of serum cholesterol. In general, unsaturation of the fat, as indicated by high iodine numbers, has been associated with lowering of the cholesterol. However, the inverse correlation of cholesterol levels and iodine numbers was not found to be sufficiently close to permit the conclusion that this is the only factor of importance. Linseed oil, for example, with an iodine number of 180, produced higher serum cholesterol values than did corn and cottonseed oil with iodine numbers of 123 and 110, respectively.

In a recent investigation, fifty different oils and combinations of oils were tested for their effects on serum cholesterol values in an assay based on the cholesterol-cholic acid-fed rat. It appears that the oils may act on this experimental system in a manner somewhat similar to those reported on the serum cholesterol values of human beings. Analytical data on the oils used and calculation of the linoleic acid content or iodine numbers of the mixtures demonstrated with certainty that neither the iodine number nor the linoleic acid content of the fat could be implicated as the determinant.

Various manipulations of the data were tried in an attempt to find some common denominator which might explain the effect on serum cholesterol values. The number obtained by multiplying the content of essential fatty acid (linoleic) by the total content of saturated fatty acid appeared most satisfactory. The results led to the conclusion that in some manner the essential fatty acids and the saturated acids act synergistically to prevent hypercholesteremia. Conversely, the unsaturated non-essential fatty acids, such as oleic acid, promote high serum cholesterol, this action being counteracted by the essential and saturated acids. The mechanism of such action remains unknown.

It is suggested that the effects of different fats on cholesterol absorption may be partially responsible. If the equation were strictly true, saturated and essential acids could be substituted for each other with equal effectiveness. The product would be highest with an equal mixture of linoleic acid and saturated acids, devoid of oleic acid or other non-essential unsaturated acids. The nearest this has been approached is an equal mixture of coconut and safflower oil (product 2120). This mixture and an equal mixture of coconut and cottonseed oil (product 1290) gave the lowest serum cholesterols in the series, 189 and 184, respectively.

Thus, it is concluded that the non-essential unsaturated fatty acids—oleic, linolenic, cleostearic, and perhaps clupadonic—promote hypercholesteremia while this action is counteracted by the essential—linoleic and arachidonic—and saturated fatty acids. So far, it appears that the essential and saturated fatty acids are equally active in this regard and substitute for each other.—*Abstracted from "The Effect of Various Fats upon Experimental Hypercholesteremia in the Rat" by D. M. Hegsted, A. Gotsis, and F. J. Stare. J. Nutrition 63: 377, 1957.*

Food in the Epidemiology of Salmonellosis[1]

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THE SALMONELLA comprise a group of approximately three hundred different but closely related bacteria producing disease in man and many species of animals. They do not persist indefinitely in nature in the free-living state. Man contracts infection by the ingestion of the organisms deriving from human or animal sources.

Three main types of disease result from infection with these organisms: (a) enteric fever (the classical example being typhoid fever), (b) gastroenteritis (food poisoning or food infection), and (c) Salmonella septicemia, or Salmonella fever, characterized by a brief febrile illness, or a prolonged or relapsing illness, with localized lesions.

Epidemiologically the Salmonella may be divided into two groups: (a) Group 1, those found only or predominantly in man, and (b) Group 2, those found in animals but which may produce disease in man. The first group consists of *Salmonella typhi*, the causative organism of typhoid fever; *S. paratyphi A; S. paratyphi B (S. schottmuelleri);* and *S. paratyphi C (S. hirschfeldii)*, the usual cases of paratyphoid fever. Group 2 contains all the others.

Organisms in Group 1 usually cause enteric fever, although infection with *S. paratyphi B* often results only in gastroenteritis. Members of Group 2 most commonly cause gastroenteritis, but many species are known to have caused Salmonella fever and enteric fever.

Every Salmonella should be regarded as potentially pathogenic for man and capable of producing any of the three categories of disease mentioned.

Transmission Sources

The Salmonella are eliminated in the feces and to a lesser extent in the urine of infected human beings and animals. They gain entrance to the body of man primarily through ingestion of food or drink contaminated with feces or urine containing these organisms. While man may contract infection from a case or carrier by direct contact through contamination of the hands and inadvertent transfer to the mouth, this is unusual and may be prevented by the practice of adequate personal hygiene. Flies feeding on feces from infected persons provide a well recognized means of contamination of food. With modern sewage disposal practices and fly control, this route is eliminated, and in areas with safe water supplies the water-borne route becomes unimportant.

In our environment, then, the significance of the human source is reduced to the role of the food handler who is an active case or carrier, and the resultant contamination of food during preparation.

In considering the role of the food handler in the dissemination of salmonellosis, the major emphasis has always been placed on the typhoid carrier, and rightly so; however, once human infection occurs with any of these organisms, epidemiologically the same considerations apply. Infections, both symptomatic and asymptomatic, are very common. Not only the active and convalescent case, but also the infected but asymptomatic individual may eliminate Salmonella in the stool for days, weeks, or months. Further, in addition to the typhoid and paratyphoid organisms, a number of species have been found producing long-term or permanent carrier states in man.

Infection of man with species occurring predominantly in animals is ordinarily by means of food contaminated with feces or urine of infected animals, or occasionally by the consumption of the flesh of such animals. While the Salmonella are widely distributed throughout the animal kingdom

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and many hosts may harbor a variety of species, only a few sources are of prime importance for man. However, all foods deriving from an animal source and not heated sufficiently to kill Salmonella should be regarded as potential sources of infection. Meat inspection practices virtually eliminate the possibility that animals ill with generalized salmonellosis may be used as food. However, during slaughtering and processing, the meat may be and often is contaminated with Salmonella organisms occurring in the intestinal tract of the animals. Subsequent heating during cooking, coupled with the fact that the numbers of organisms present may be too small to produce infection, unless they have an opportunity to multiply, reduces the risk from this source.

Two important sources of Salmonella infection for man are rodents and poultry. Many species of Salmonella are known to occur in rats and mice. Any food to which they have access may become contaminated. In commercial practice, rats and mice may contaminate a great variety of foods during harvesting, shipping, and storage. This route may be minimized by rodent control and protection of food from access by these animals.

Poultry and Eggs as Source of Salmonella

Poultry presents a special problem. Sixty species of Salmonella have been found in poultry (1). These organisms as a rule occur in the intestinal tract, and during dressing, the flesh becomes contaminated. For instance, Salmonella has been cultured from the skin of turkeys frozen for thirteen months (2). Further, they may be resident in the tissues (lymph glands) of apparently healthy fowl and thus be present in the marketed carcass.

Eggs and egg products present an even more serious problem. *S. pullorum* frequently, and other species occasionally, produce infection in the ovary and are present in the freshly laid egg. During laying, the egg shell becomes contaminated by fecal material. Egg shell is porous, and under improper storage conditions organisms which occur on the shell may penetrate to the inside (3). Even so, the numbers of organisms in marketed eggs are usually too small to cause human illness unless they have an opportunity to multiply during food preparation. The eggs of turkeys and ducks are more dangerous than hens' eggs.

Broken-egg products are much more important. During breaking, organisms on the shell gain entrance to the product. Spray-dried, whole egg powder has been a notorious source of Salmonella infection. Currently, frozen egg yolk and egg whites are widely employed in the food industry. Both of these products are known frequently to contain Salmonella organisms. We have recently studied an outbreak of salmonellosis due to *S. tennessee*, involving forty cases, traced to frozen egg yolk. This material had inadvertently been used in cake frosting and in small amounts in a special pie, without sufficient subsequent heating.

All of these egg products must be considered to contain Salmonella, the only question being the degree of contamination and the species involved. None of these products should be used except in baked goods or in other foods subsequently heated sufficiently to kill all the Salmonella. They should *never* be used in eggnog or other non-heated foods, or in place of shell eggs for preparing scrambled eggs or omelets, since in their preparation these foods do not reach temperatures which will kill all of the organisms.

Proper Food Handling

No matter how food becomes contaminated, the risk of human infection is greatly increased if there is an opportunity for the organism to multiply prior to ingestion. All foods which may potentially contain Salmonella should, in their preparation, be heated to temperatures believed sufficient to kill all of the organisms. They should then be consumed promptly, or be properly refrigerated, to minimize the opportunity for multiplication of any organisms which may have survived the heating process.

Roast turkey presents a special hazard in this regard. Many infected birds or carcasses contaminated during killing and dressing reach the market. The size of the carcass and the use of stuffing, together with the fact that the meat is often not all consumed at one meal, or is held at room temperature or on a steam table and served over a period of several hours, increases the chances for survival and multiplication of Salmonella. Many outbreaks are due to this source.

Infectivity

Both the number of Salmonella organisms ingested and the species or strain characteristics seem of importance in determining whether infection results. Several years ago we fed cultures of various Salmonella species isolated from spray-dried egg powder to human volunteers in graded dosages and determined the minimal infective dose of the strains used (4, 5). For each strain there was a dose which produced illness; lesser numbers of organisms led to no symptoms, but often to transient carrier states lasting for days, weeks, or several months. Such transient carrier states were often produced by ingestion of a few thousand organisms.

Infectivity varied a great deal. For instance, illness resulted with *S. meleagridis* at 7 to 10 million organisms; with *S. bareilly* at 125,000; *S. newport* at 152,000; *S. anatum* at 44,500,000 to 67,200,000; and *S. derby* at 15 million; while with *S. pullorum*, several billion were necessary. All of these dosages

are well within the range which might be encountered under natural conditions in the ingestion of food.

Lethal Temperatures

The amount of heat necessary to kill Salmonella in food is of prime importance. The minimum temperatures and heating periods necessary are not accurately known for all foods. The general recommendation is that an inside baking temperature of 350°F. (177°C.) for 30 min. is the minimum for safety. Recently, studies in this regard show that somewhat lower temperatures may be sufficient for certain items (6).

Solowey and Calesnick (7) prepared test scrambles from experimentally and naturally contaminated, reconstituted egg powders. They recovered Salmonella from scrambles cooked by both beaker and skillet methods. The longest cooking period after which Salmonella was isolated was 17 min., 11 seconds at 132.8°F. (56°C.).

Knowles (8) found that 99.9 per cent of the initial total flora of liquid egg could be destroyed by heating to 146°F. (63.5°C.) for 2 min. Murdock (9) tested this procedure for its efficacy in the destruction of Salmonella in egg mixtures. He found that a large proportion, but not all of the Salmonella were eliminated. Of 105 samples positive before treatment, 15 still yielded Salmonella afterward. Anellis *et al.* (10) reported that the time required for complete destruction of Salmonella in egg mixtures at 140°F. (60°C.) varied with the *p*H; the time required at *p*H 5.5 was 7 to 9 min., at *p*H 8.0, 2 to 3.5 min. At present, there is no proved method of treating liquid egg preparations which will regularly and dependably kill all the Salmonella organisms which they may contain without adversely affecting other desired properties.

Incidence of Salmonellosis

The incidence of food-borne salmonellosis is not accurately known, but it is great, perhaps rivalling the common cold in frequency. Most cases do not come to medical attention. Only the more severely ill cases and outbreaks involving numbers of people are reported and appear in our vital statistics. These figures, although representing but a fraction of the incidence, do provide some lead to the importance of certain foods and sources of infection. In the first nine months of 1957, twenty substantiated outbreaks were reported to the National Office of Vital Statistics (11). The food source and infecting species are tabulated below.

Turkey (9 outbreaks)	... *S. typhimurium* (7); *S. anatum* (1); *S. newport* (1).
Turkey salad	... *S. reading.*
Ice cream (3 outbreaks)	... *S. typhimurium* (2); *S. heidelburg* (1)
Potato salad (2 outbreaks)	... *S. montevideo; S. reading; S. bareilly* (1); *S. tennessee* (1).
Chicken salad	... *S. oranienburg*
Frozen egg yolk (cake filling)	... *S. tennessee*
Ox-tail stew	... *S. anatum*
Canned ham	... *S. typhimurium*
Meat loaf	... *S. typhimurium*

These data reveal the importance of poultry and poultry products (eggs) in the epidemiology of salmonellosis in the United States. The list of foods which have been incriminated as vehicles in outbreaks of Salmonella gastroenteritis is long and includes such varied items as sliced watermelon, codfish cakes, custard, egg nog, baked Alaska, baked ham, spaghetti, chopped liver, bread pudding, milk, mutton, rice pudding, scrambled eggs, pork sausage, smoked fish, lemon pie, cream pie, cheese, chocolate eclairs, smoked sausage, mayonnaise, veal salad, pickles, cream cakes, and meat pies.

Preventing Food-Borne Salmonellosis

Prime responsibility for the prevention of food-borne salmonellosis rests with those who prepare and serve food. In addition to the precautions previously mentioned, particular attention should be paid to the food handler. At the time of employment the stool should be examined bacteriologically to detect the long-term carrier. Such individuals should not be employed in situations where they may contaminate food. The detection of acute cases and asymptomatic shedders can never be accomplished completely, but every effort should be made to reduce the risk from these sources.

Persons preparing and serving food should be thoroughly and repeatedly indoctrinated in regard to the health hazards involved and encouraged to report all illnesses. Those with gastrointestinal symptoms should be relieved of their duties pending the results of stool cultures, and, if Salmonella are found, until they cease excreting the organism. Routine repeat stool examinations are of value in detecting cases not reported to the supervisor and the infected but asymptomatic individuals who are excreting organisms, particularly those who may become long-term carriers.

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Food Facts Vs. Food Fallacies

A four-page leaflet, "Food Facts vs. Food Fallacies," has been issued by the Food and Drug Administration. It is especially recommended to all who are interested in improved health by the Committee on Nutrition Information, Food and Nutrition Section, American Public Health Association. Excerpts from the leaflet follow:

The American food supply is unsurpassed in volume, variety, and nutritional value. By patronizing all departments of a modern food store, we can easily supply all of our nutritional needs . . .

Notwithstanding the abundance and quality of the American food supply, a persistent campaign is being carried on to undermine public confidence in the nutritional value of staple foods. False ideas about food are circulated by food faddists and by fringe promoters of vitamin and mineral products. Such products are sometimes offered as cure-alls for serious disease conditions. This may be dangerous to health, especially if ailing people are led to put off getting proper medical attention.

Modern as well as ancient myths and superstitions about food are utilized by faddist promoters. Such notions as the old idea that fish and celery are "brain foods," or that oysters increase fertility, are harmless, but when garlic pills are promoted for high blood pressure, or grapes for the treatment of ulcers and cancer, the price of ignorance may come high. This is quackery . . .

Today, the Food and Drug Administration is especially concerned about the promotion of "food supplements" as cure-alls for conditions which require medical attention.

Misleading promotion of food supplements violates Federal law. It is commonly carried on in two different ways:

(1) One method is by so-called "health food lecturers" who claim, directly, or by inference, that the products they are promoting are of value in preventing or curing disease, when in fact, they are ineffective for such purposes. Some of these lecturers put on a program that has the emotional appeal of a "revival" meeting. Others pose as highly qualified scientists. Their talks are a blend of science and superstition concerning nutrition, right living, psychology, sex, and, of course, salesmanship for the products which the particular lecturer happens to be pushing. Usually an ad is placed in a local newspaper announcing several free lectures. These are the "come-on" for the paid series which follows.

(b) A second and widespread method is by door-to-door selling. While this may be carried on as a legitimate business, there are, unfortunately, agents who take advantage of the privacy of the home to prescribe high-priced food supplements for any disease or condition which an ailing customer may mention.

Both kinds of sales agents use a scare technique in selling their vitamin, mineral, and herbal preparations. False ideas about food are their stock in trade . . .

Nutrition authorities agree that the best way to buy vitamins and minerals is in the packages provided by nature—vegetables, fruits, milk, eggs, meats, fish, and whole grain, or enriched bread and cereals . . .

Effect of Weight Loss on Respiratory Functions[1]

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BECAUSE OF the paucity of information regarding the effect of weight-reducing on physiologic responses, this investigation was undertaken to determine the effect of weight loss on some respiratory functions.

Review of Literature

There are but few reports in the literature, which are pertinent to the question of the effects of weight loss on repiratory functions. The studies reported deal more with oxygen consumption and efficiency than other respiratory functions.

The first study on oxygen consumption and obesity which pertains directly to the investigation reported here was done by Wang *et al.* (1). They were interested in obtaining a comparison of the mechanical efficiency of obese women with that of normal and underweight women. Work was performed on a bicycle ergometer, in the post-absorptive state. Mechanical efficiency (oxygen consumption) was found to vary inversely with the percentage overweight. It was also found that, on a percentage overweight basis, there was a gradual decrease in mechanical efficiency with an increase in obesity.

Strang and Evans (2) studied the basal metabolism (oxygen requirements) of obese subjects before and after dietary restriction and compared the results with others reported in the literature for various dietary procedures. Many of the earlier studies had used only body weight as a reference standard and Strang and Evans recalculated these data on the basis of surface area. They concluded that the physiologic reaction in the obese to reduction by diet differs markedly from that in a subject of normal weight. In the latter individual, there was a severe reduction of energy, even though he started at normal levels. In the obese, the depression of energy exchange was very much less in proportion to the limitation of diet and weight loss and was only a return in the direction of normal.

The effect of body size on energy exchange in work was studied by Robinson (3), using two men who ran or walked up a grade on a motor-driven treadmill at rates which raised metabolism (increased oxygen consumption) seven to eleven times the basal requirement. The efficiency of a man weighing 99 kg. was found to be the same as that of a man who weighed 61 kg. Changing the environmental conditions so that the dissipation of heat was limited, Robinson then found the smaller man could perform more efficiently.

Mayer (4) has shown that if the oxygen cost of exercise is approximately proportional to body weight, the overweight person will require more energy for the same amount of exercise than would a less heavy individual.

An evaluation of the many studies on basal oxygen requirements of the obese was done by Pennington (5). He was primarily concerned with the cause of obesity, whether it be overnutrition or a disease of metabolism. His evaluation of published results of other investigators showed a decline in energy expenditure of the obese during caloric restriction, though less than that of people of normal weight during subcaloric nutrition.

As far as can be determined no one has studied the obese subject relative to the amount of oxygen required to perform a given amount of work before, during, and after a weight-reducing regimen.

Experimental Design and Techniques

The design of the investigation consisted essentially of four periods: (a) orientation, (b) maintenance of the overweight, (c) weight reduction, followed by, (d) maintenance of reduced weight.

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ORIENTATION

The orientation period was of five weeks' duration. During this time the subjects learned the techniques for performing the various tests of physiologic functions.

During the latter part of the orientation, they obtained their food in the cafeteria in the employee's dining room of the University Hospital. There were no restrictions on the kind and/or amount of food that could be chosen. A menu of the day's fare was presented in the morning and each subject was required to note the kind and approximate amount of food he wished for the day. This process enabled the nutritionists who were to be in charge of the preparation and serving of future calorically controlled diets to prepare the meals to the best advantage for each subject.

During all subsequent periods, the food was prepared in the diet kitchen, and each individual reported at designated meal hours and obtained his tray for each meal. The subjects were encouraged to eat as a group at a table which was reserved especially for them.

A schedule of convenient times for the subjects to come to the Physiology Laboratory for the tests was made, and each subject reported once each week, on the same day of the week and at approximately the same hour.

MAINTENANCE OF OVERWEIGHT (INITIAL MAINTENANCE PERIOD)

This period lasted for four weeks, during which the dietary calculations were adjusted and corrected to maintain the overweight status of each individual. Within narrow limits, most subjects maintained their weight for this period as a result of the calculated diet. When gross deviations were seen, the diets were adjusted.

WEIGHT LOSS

The length of this period varied and was, of necessity, related to the percentage overweight of each subject and the rate of weight loss. The difficulties presented in providing reduced caloric diets which were nutritionally adequate and which subjects would eat over a rather long period led to the conclusion that the best way to solve the problem was to prescribe a diet which provided for a slow weight loss.

MAINTENANCE OF REDUCED WEIGHT (FINAL MAINTENANCE PERIOD).

The reduced weight attained by each subject was maintained for four weeks by the addition of 1000 calories per day to the reducing diet.

SUBJECTS

Sixteen subjects, men and women, participated. All were healthy, although overweight, normal adults, as evidenced by a complete physical examination. The sample included four men, twenty-four to thirty-two years of age, and twelve women ranging in age from twenty-two to thirty-seven years. A description of the subjects, together with their initial weights and weight losses, is shown in Table 1.

CALCULATING CALORIC REQUIREMENTS

Maintenance Diets. A maintenance diet may be defined as one which supplies an energy intake, in the form of food, equivalent to the energy expenditure of the individual. There are several methods by which the total daily energy expenditure can be determined, but most of these are not readily adapted to a long-term program. Hence, an estimate of the daily caloric expenditure, which varies with age, sex, height, activity, and the amount of excess weight was made according to Jolliffe's method (6).

TABLE 1 **Description of the subjects**

SUBJECT	SEX	AGE	HEIGHT	INITIAL WEIGHT	NORMAL WEIGHT	PER CENT ABOVE NORMAL	FINAL WEIGHT	PER CENT OF INITIAL ABOVE FINAL WEIGHT
		yr.		*lb.*	*lb.*		*lb.*	
1	M	24	5′10″	220	162	36	187	18
2	F	25	5′ 1″	233	126	85	146	59
3	M	25	5′11″	251	180	39	190	32
4	F	22	5′ 4″	168	132	27	129	30
5	F	28	5′ 2″	167	128	30	134	25
6	F	24	5′ 4″	169	136	24	148	14
7	F	22	5′10″	307	166	85	200	54
8	F	35	5′ 0″	142	124	14	126	13
9	F	29	5′ 6″	199	148	34	154	29
10	F	27	5′ 7″	172	146	18	143	20
11	M	24	6′ 3″	231	190	22	188	23
12	F	25	5′ 6″	168	142	18	138	22
13	F	37	5′ 3″	160	132	22	133	22
14	F	22	5′ 6″	165	142	16	134	23
15	M	32	5′ 9″	200	166	21	174	15
16	F	24	5′ 3″	155	136	17	126	23

Reducing Diets. There are many points which must be considered in prescribing reducing diets, especially for those who wish to lose considerable poundage. It is obvious that the lower the caloric intake, the greater these problems become. To minimize these problems, it was necessary to use diets which provided for a moderate weight loss. Calculations showed that for our subjects, good diets, which were acceptable and which could be eaten over a relatively long period which provided for a weight loss of 2 lb. per week, could be provided.

To accomplish this goal, a total of 1000 calories was subtracted from the daily caloric allowance for energy expenditure. This computation was based on a required deduction of 3500 calories to lose 1 lb.

Weekly measurements of body weight (nude) were made, and the daily caloric intake was adjusted periodically as necessary. These adjustments were most often made after a loss of 25 lb., which required a deduction of 100 calories, the equivalent of 4 calories added for each pound of body weight above the average weight. The deductions were not made more frequently, since the error involved was so small.

A 1500-calorie diet was used as the basis for the weight reduction calculations. By adding to, or subtracting from this, the desired daily calculated caloric intake could be achieved. In this experiment, a daily diet of not less than 1700 calories was sufficient to achieve the prescribed weight loss for the majority of subjects.

The basic 1500-calorie diet plan is shown in Table 2. The calculations were made from data presented by Bowes and Church (7). There were no restrictions, except in the matter of calories.

One problem in prescribing weight-reducing diets is the breakfast. An adequate breakfast, which maintains efficiency in the late morning hours has been established as one which provides one-fourth the total daily caloric requirements and protein allowance, with not less than 15 gm. protein. With a moderate weight-loss plan, these requirements can be met quite satisfactorily. The breakfasts and bedtime snacks were built around cereal and milk because of the wide varieties of cereals available and the convenience in serving. In addition to their nutritional contributions, they are low in fat and devoid of cholesterol.

TABLE 2 Basic 130-gm. protein, 1500-calorie diet

FOOD	AMOUNT	PROTEIN	CALORIES
	Breakfast		
	gm.	*gm.*	
Juice, fresh oranges	123 (½ c.)	1.0	54
Cereal, cooked	157 (⅔ c.)	3.6	100
Milk, skim	246 (1 c.)	8.6	87
Bread, enriched toasted, 2 slices	46	4.2	110
Sugar	4 (1 tsp.)	—	16
Butter	5 (1 tsp.)	—	36
Total		17.4	403
	Lunch		
Cottage cheese	225 (1 c.)	43.9	215
Pineapple	100 (1 slice)	0.4	78
Milk, skim	246 (1 c.)	8.6	87
Salad, lettuce-tomato		0.5	25
Total		53.4	405
	Dinner		
Steak, round	180 (6 oz.)	48.0	414
Potato, baked	50 (½)	1.2	50
Beans, green	83 (⅔ c.)	1.2	18
Butter	5 (1 tsp.)	—	36
Salad, cabbage-onion		0.5	25
Juice, tomato	121 (½ c.)	1.2	25
Total		52.1	568
	Bedtime Snack		
Cereal, ready to eat	30	3.1	104
Milk, skim	123 (½ c.)	4.3	43
Sugar	4 (1 tsp.)	—	16
Total		7.8	163

MEASUREMENT OF METABOLIC RESPONSES

All metabolic responses were measured while the subject was seated on the bicycle ergometer (8). A modified Benedict-Roth spirometer was used, utilizing a closed-circuit technique.

The respiratory functions studied were:

(a) Respiratory rate.
(b) Tidal volume.
(c) Minute volume.
(d) Resting oxygen consumption.
(e) Oxygen consumption required to perform a given amount of work.
(f) Calculation of oxygen debt from the values obtained in (d) and (e).

All respiratory measurements were calculated from the metabolism chart record produced by an ink-writing pen in contact with the chart and connected to the spirometer bell by a pulley system.

Respiratory Rate. This measurement was made by counting the lines on the metabolism chart which were imposed by each respiratory cycle. The cycles for a 5-min. period were counted, from which a mean value per minute was calculated.

Tidal Volume. Tidal volume is the amount of air inhaled or exhaled during a respiratory cycle. In the normal individual at rest, tidal volume usually is stated as 500 ml. In this study, the calculation was made as follows: A base line of best fit was drawn along the bottom of the record. Then a line of best fit was drawn along the top, parallel to the base line. The vertical distance between these lines represented the average tidal volume for the period. By multiplying this vertical distance by the spirometer

constant, the tidal volume was obtained. All tidal volumes were corrected for changing spirometer temperature to body temperature of 37°C., saturated with water vapor and at ambient barometric pressure.

Minute Volume. This measurement, which is the volume of air exchanged during 1 min., was calculated by multiplying the mean respiratory rate per minute by the tidal volume corrected to the body temperature, ambient pressure, and saturation.

Resting Oxygen Requirement. Resting oxygen consumption is the volume of oxygen required to maintain the body at rest. The average value is usually stated as 250 ml. per minute. The resting oxygen consumption for at least 5 min. was recorded just prior to the work. The oxygen consumption was calculated from the slope of the spirogram as is done in determining basal metabolic rate. All oxygen values were corrected to standard temperature and pressure, dry.

Measurement of Oxygen Required to Perform Work. To determine any effects that a reduction in body weight might have on the amount of oxygen required to perform work, the amount of work the subject does must be the same for all experimental conditions. Thus, the first concern was the selection of a type and amount of work suitable for each subject. Several factors were considered in selecting the work load. One was that the work load be well within the capacity of the subject, yet sufficiently difficult to differentiate between changes in oxygen requirements. As a result of trials made during the orientation phase, the work selected was 1250 kg.-m. for 1 min. and 720 kg.-m. for 1 min. for the men and women, respectively. The work was measured with a bicycle orgometer (8).

The oxygen consumption during 1 min. of work and recovery was calculated by dividing the recovery phase into 1-min. intervals. A line of best fit was drawn along the bottom of the spirogram for the work minute and for each minute of recovery. The total amount of drum drop (in millimeters) during work and recovery was multiplied by the spirometer constant, the result being the milliliters of uncorrected oxygen used during work and recovery.

The oxygen required to perform the work was calculated from the expression:

work oxygen = oxygen used during work and recovery − resting oxygen used for the equivalent length of time

Oxygen Debt. Oxygen debt represents the oxygen used during work over and above that supplied to the body during work which must be paid back after the work is completed. Oxygen debt was calculated according to the expression:

oxygen debt = total oxygen used during work and recovery − oxygen used during the work period + resting oxygen during recovery

All values for oxygen consumption have been expressed without and with body weight in kilograms as a reference standard.

STATISTICAL ANALYSIS

An unrelated sample statistical technique (9) was used to analyze the data. The null hypothesis was rejected at the 5 per cent level of confidence.

To compare the effects of weight reduction among the subjects, the weight loss period was divided into two segments. First, the total weight loss for each subject was determined and divided into approximately equal parts. Thus, each segment of the weight-reducing period represented half of the weight loss. The mean was calculated for each function studied during the time elapsed for each segment. These were equivalent to approximately zero to 50 per cent and 50 to 100 per cent weight losses, respectively. Hence, the various phases of the experiment are as follows:

Period 1 = initial maintenance phase
Period 2 = zero to 50 per cent of the weight lost
Period 3 = 50 to 100 per cent of the weight lost
Period 4 = maintenance of reduced weight

The means for each period were determined and a "t" value was calculated according to the scheme: Period 1 vs. 2; Period 1 vs. 3; and Period 1 vs. 4.

Results

RESPIRATORY RATE

Data pertaining to the effect of weight loss on respiratory rate are shown in Table 3. The respiratory rate was not significantly affected by weight loss. However, a decreased resting respiratory rate occurred in three subjects and an increased rate in two when the control value was compared with the final maintenance period. A significant decrease in respiratory rate from the initial maintenance period throughout the next three periods was shown in only three subjects. One had a significantly decreased respiratory rate during weight reduction which returned to control level during the final maintenance period. No change in the respiratory rate occurred during any of the periods in ten subjects.

TIDAL VOLUME

Data on the effect of weight loss on tidal volume are also shown in Table 3. A comparison of the mean shows that tidal volume was not significantly affected by weight loss. The changes in resting tidal volume varied among the subjects. Nine subjects showed no change, six had significant decreases, and for one subject, a significant increase in tidal volume occurred when the final maintenance period was compared with the initial maintenance period. The increased tidal volume occurred in one subject who also had a decreased respiratory rate during the same period. Four subjects showed a decreased tidal volume but no significant change in respiratory rate.

TABLE 3 Effect of weight loss on resting respiratory rate, tidal volume, and minute volume for each period, together with a comparison of Period 1 with Periods 2, 3, and 4

SUBJECT	MEAN FOR PERIOD 1	PERIOD 2		PERIOD 3		PERIOD 4	
		Mean	Significance	Mean	Significance	Mean	Significance
				Respiratory Rate			
	r./min.	*r./min.*	%	*r./min.*	%	*r./min.*	%
1	11±0.9†	8±1.1	0*	9±1.3	0*	9±0.7	1*
2	19±1.9	19±1.8	66	20±1.4	14	20±0.8	25
3	7±0.8	5±0.2	2*	4±0.1	1*	4±0.3	1*
4	18±0.7	17±0.2	27	18±0.2	86	23±0.3	0*
5	10±0.5	11±1.1	25	10±0.3	67	9±0.5	21
6	14±0.4	13±0.4	30	14±0.5	96	14±1.2	81
7	13±0.6	14±1.2	22	16±0.3	0*	16±0.4	0*
8	12±1.3	11±1.4	16	11±1.1	62	12±1.0	95
9	11±1.1	10±0.6	58	11±1.2	77	10±0.8	28
10	12±1.2	12±0.7	81	11±0.7	19	12±1.0	47
11	12±0.5	9±0	0*	10±1.4	1*	11±0.7	30
12	12±1.7	9±1.0	5*	8±0.5	1*	9±0	4*
13	17±2.3	16±1.3	42	17±0.8	100	19±0.6	17
14	10±0.5	11±1.2	17	10±1.7	68	12±1.3	15
15	10±1.4	11±1.4	30	11±2.4	30	12±2.1	21
16	10±0.6	9±0.6	85	10±0.8	22	10±0.8	34
Mean	12.4±3.2	11.6±3.6	52	11.9±4.1	69	12.6±4.8	92
				Tidal Volume			
	ml.	*ml.*		*ml.*		*ml.*	
1	964± 96	1137±134	11	984± 83	84	1006± 35	68
2	628± 44	566± 43	1*	479± 33	0*	447± 33	0*
3	1433±334	1554±179	50	1887±263	2*	2531±396	4*
4	517± 24	504± 21	30	457± 24	0*	441± 14	0*
5	630± 18	554± 81	2*	558± 38	0*	596± 45	21
6	537± 91	591± 58	23	588± 52	34	597± 89	33
7	876± 89	829± 44	25	728± 90	0*	662± 38	0*
8	585± 31	575± 44	56	573± 62	58	555± 4	7
9	779± 44	767± 46	63	702± 63	0*	791± 15	65
10	743± 44	657± 48	0*	563± 63	0*	583±126	11
11	1121± 74	1067± 59	24	937± 74	0*	831± 38	0*
12	729± 60	773± 33	21	714± 77	71	755± 80	66
13	520± 34	572± 80	33	524± 49	78	536±140	96
14	661± 70	629± 66	68	661± 36	100	666± 32	51
15	987± 30	1010± 84	55	873±135	8	806±112	2*
16	797±104	786± 62	89	698± 52	22	597± 32	4*
Mean	782±249	786±283	95	745±342	95	775±491	95
				Minute Volume			
	l./min.	*l./min.*		*l./min.*		*l./min.*	
1	10.01±1.08	9.63±1.85	65	9.48±0.90	36	8.70±0.30	48
2	11.85±1.85	10.80±0.87	26	10.10±0.80	57	8.97±1.05	2*
3	9.49±1.07	7.28±0.80	0*	6.29±1.04	0*	9.41±1.44	41
4	9.14±0.86	8.45±1.31	19	8.04±0.51	0*	7.74±0.46	1*
5	6.14±0.55	6.13±0.64	98	5.30±0.53	2*	5.34±0.42	6
6	7.17±1.30	7.66±0.88	45	8.02±0.97	19	8.21±0.59	13
7	10.68±1.88	11.75±1.44	22	11.24±1.05	48	10.58±0.61	91
8	6.90±0.78	6.18±1.03	16	6.47±0.62	27	6.65±0.46	42
9	8.41±0.98	8.13±0.89	58	8.67±0.85	59	8.35±0.76	95
10	9.01±1.26	7.92±0.71	0*	6.40±1.02	0*	6.67±1.04	2*
11	11.69±2.16	9.61±0.54	14	9.24±1.41	4*	9.42±0.92	9
12	8.21±0.68	7.16±0.69	3*	5.96±0.66	0*	6.78±0.72	4*
13	8.80±0.94	9.16±1.02	56	8.92±1.31	84	10.16±2.72	38
14	6.87±0.82	6.88±0.91	98	6.71±1.40	80	7.63±0.62	16
15	9.93±1.50	11.02±0.79	22	9.42±0.66	54	9.35±1.26	58
16	7.59±1.24	7.41±0.77	80	6.98±0.80	38	5.95±0.26	4*
Mean	8.87±1.70	8.45±1.72	49	7.95±1.71	14	8.12±1.53	20

*All values of 5 per cent or less are significant.

†Standard deviation.

MINUTE VOLUME

Data on minute volume are presented in Table 3. Weight loss did not affect minute volume significantly. The resting minute volume values were not significantly changed in eight cases throughout all experimental periods. A significant decrease from control was seen in two subjects for all experimental periods, while the onset of the decrease was slower in three other subjects. A decreased minute volume during one or both segments of the reducing regimen followed by a return to control level occurred in three subjects.

There seems to be no positive relationship among the changes in respiratory rate, tidal volume, and minute volume. In some cases, a significantly decreased respiratory rate occurred in conjunction with no significant change in tidal volume and did not result in a significant decrease in minute volume. Others showed a steady respiratory rate, a decreased tidal volume, and no significant change in minute volume. A decreased minute volume without accompanying significant changes in respiratory rate and/or tidal volume was seen in several cases. However, these irregularities are readily explained as a result of the application of a Student "t" test for significance. In instances where the expected decreases are not significant, they are nevertheless decreased in magnitude from control values.

RESTING OXYGEN CONSUMPTION

Oxygen consumption was measured before work while the subject was seated on the ergometer, and calculated both with and without a metabolic reference standard. The means of the data for all experimental periods, together with their comparisons, are shown in Table 4. Without a metabolic standard, there was a progressive decrease in oxygen requirement resulting from weight loss. These decreases were significant in Periods 3 and 4. An examination of the individual data (not included) showed a significant decrease in oxygen consumption in ten cases when Period 4 was compared with Period 1; seven of these also had decreases during Periods 2 and 3, whereas the decrease became significant during Period 3 in the remaining three cases. The reduction of body weight was not accompanied by a significant decrease in resting oxygen consumption in six cases.

When oxygen consumption was expressed in values using body weight as a reference standard (milliliters per kilogram), the results were, in general, unlike those seen when no metabolic reference standard was used. The mean data (Table 4) indicate that resting oxygen requirement was not significantly affected by weight loss. An examination of the individual data showed that the oxygen consumption remained unchanged from control in six subjects during the entire experiment. A progressive increased oxygen consumption occurred in six others, while a phasic response of a decrease, increase, and no difference from control during Periods 2, 3, and 4, respectively, was seen in one subject. An increased oxygen consumption during the second segment of the weight loss periods, preceded and followed by no significant difference from the control occurred in one subject.

TABLE 4 Mean values for resting oxygen, oxygen required for work, and oxygen debt for each experimental period, together with a comparison of Period 1 with Periods 2, 3, and 4

PERIOD	MEAN	t	SIGNIFICANCE
	Resting Oxygen		
	ml./min.		%
1	321± 61*		
2	287± 49	1.74	10.0
3	271± 47	2.60	1.4
4	272± 50	2.46	1.8
	ml./kg./min.		
1	3.69±0.47		
2	3.07±1.24	1.82	8.2
3	3.73±0.35	0.29	76.6
4	3.92±0.29	1.86	6.7
	Oxygen Required for Work		
	ml.		
1	2419±526		
2	2038±393	2.32	2.86
3	1712±310	4.65	0.01
4	1592±332	5.99	0.
	ml./kg.		
1	27.56±2.78		
2	24.94±2.28	3.03	0.54
3	23.85±2.19	4.22	0.02
4	22.89±3.07	4.49	0.01
	Oxygen Debt		
	ml.		
1	1227±306		
2	1039±203	2.09	4.43
3	889±162	3.91	0.05
4	813±139	4.83	0.
	ml./kg.		
1	14.18±2.09		
2	12.77±1.13	2.39	2.28
3	12.22±1.19	3.26	0.25
4	11.79±1.48	3.72	0.09

*Standard deviation.

OXYGEN REQUIRED TO PERFORM A GIVEN AMOUNT OF WORK

The oxygen required to perform the same amount of work each week for each subject was calculated on the basis of total oxygen used and also with body weight as a metabolic reference standard. The mean data are presented and compared in Table 4. Generally, the oxygen required to perform the work decreased progressively from the initial maintenance

period; this finding was applicable to both types of calculation. In only one case was there no significant difference from control in the total oxygen requirement during any succeeding phase of the experiment. However, when body weight was used as a metabolic reference standard, it was found that in four cases there was no significant change in the oxygen used for the work performance. Two subjects used significantly less oxygen during Period 3, but the requirement was increased to the initial maintenance level during Period 4.

OXYGEN DEBT

The oxygen debt incurred as a result of the work performance was also calculated with and without a reference standard. Mean data are presented and compared in Table 4. In most cases, using either calculation, the oxygen debt was significantly decreased in magnitude. Expressing oxygen debt without any reference standard revealed a decrease in the magnitude in twelve cases and no significant change in four subjects when Period 1 was compared with Period 4. A decrease during Period 3 followed by a return to control value during Period 4 occurred in two subjects, but no significant differences from control during Periods 2, 3, and 4 were seen in two others. Although twelve subjects showed a decrease in oxygen debt during Period 4, the decrease did not occur until Period 3 in three and not until Period 4 for one subject.

When body weight was used as a metabolic reference standard, there was a significant decrease in oxygen debt during Periods 2, 3, and 4 when compared with Period 1 in five subjects, during Periods 3 and 4 in two subjects, and not until Period 4 in two other subjects. The oxygen debt was not significantly different from the initial maintenance period during any succeeding periods in six subjects. Only one subject had a decreased oxygen debt during the weight-reducing periods with an increase to control during the final maintenance period.

Summary and Conclusions

Data on metabolic responses were collected from twelve women and four men ranging in age from twenty-two and thirty-seven years. Weight of the subjects ranged from 14 to 85 per cent above average. Nutritionally adequate diets were used to produce a decrease in body weight calculated to proceed at the rate of 2 lb. per week. The following physiologic functions were studied before, during, and after the weight-reducing regimen: respiratory rate, tidal volume, and minute volume and oxygen consumption, at rest. In addition, the oxygen required to perform a given amount of work (1250 kg.-m. per minute and 720 kg.-m. per minute for the men and women, respectively) was calculated.

On the basis of the data collected before and after weight reduction, the following conclusions are warranted:

Resting respiratory rate was not significantly changed in the majority of the subjects by a reduction in body weight.

The majority of the subjects showed no significant change in resting tidal volume. However, six subjects had a resting tidal volume which was significantly less than control and one subject showed an increase.

Weight reduction was not followed by any significant change in resting respiratory minute volume in the majority of the subjects.

Ten subjects had significantly less resting oxygen consumption after weight loss, while six subjects showed no change.

Ten subjects showed no change in resting oxygen requirements, calculated on the basis of milliliters per kilogram body weight. Six showed an increase.

The oxygen required to perform a given amount of work was significantly decreased during the post-reduction phase of the experiment. A reduction in body weight was followed by a significant decrease in the oxygen required to perform a given amount of work when body weight was used as a metabolic reference standard in ten subjects; in six subjects, there was no change.

The oxygen debt caused by work performance expressed as milliliters was significantly reduced in twelve subjects. In four, there was no change. Oxygen debt expressed as milliliters per kilogram body weight was decreased in nine subjects after weight loss. No consistent change was seen in seven cases.

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Published vs. Analyzed Values for Ascorbic Acid[1]

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DATA OBTAINED over a three-year period from determinations of total ascorbic acid in foods served in an institution are summarized in this paper. The values are compared with those given for similar foods in Agriculture Handbook No. 8 (1). This work was done in connection with a regional project in human nutrition concerned with the ascorbic acid metabolism of women living in an institution. Agriculture Handbook No. 8 was the recommended source of information for those members of the region who must depend on calculations for evaluating dietary intakes. For the purpose of obtaining ascorbic acid values specific to this study, the most common foods of the institution menu were analyzed in our laboratory. It seemed worth while to compare our results with the values published in the Handbook (1) for the benefit of dietitians and others who may wish to learn what ascorbic acid values may be expected under similar conditions.

The study was conducted from December through April in 1953 and 1954, and through March in 1955. The report is restricted to the total ascorbic acid values found in fresh and canned vegetables, liver, and milk. Citrus fruits, tomatoes, and other foods rather high in ascorbic acid are not represented, since for the purpose of the experiment, such foods were omitted from the diet in order to provide a low, uniform, daily intake of ascorbic acid. As the few canned fruits analyzed in this study were comparable in ascorbic acid content to the values given in Handbook No. 8, these values are not discussed.

The 124 samples reported here, out of a total of 180 samples collected for analysis, are those thought to be of most interest to dietitians who prepare and serve food in quantity. The food samples were taken from the steam table or carts in the dining room when the women were being served. The food generally had been standing for varying lengths of time after preparation, ranging from 30 min. to about an hour. Collections of food samples were made while the subjects were eating, so as to obtain samples of the food ingested.

Fifty-gm. samples of the foods were blended with 5 per cent metaphosphoric-10 per cent acetic acid, filtered, and the filtrate frozen for future analysis. In case of delay in mixing, the samples were protected by refrigeration. Triplicate analyses for total ascorbic acid were made on all samples by the 2,4-dinitrophenylhydrazine method of Roe and Kuether (2), using norit oxidation. The results are presented in Table 1, with the ascorbic acid values of similar foods from Handbook No. 8. The authors of this handbook state that ascorbic acid values reported therein have been based for the most part on determinations of reduced ascorbic acid. Hence, they consider that their values in general may be an underestimation (1).

In most of the foods analyzed there was a rather wide range of ascorbic acid values, no doubt due to the differences in original quality of the product, variety, seasonal fluctuation, length of cooking time, amount of water present, and time on the steam table. Two of the canned and heated vegetables, sauerkraut and spinach, showed a much lower average ascorbic acid value than that given in Handbook No. 8. This may have been due to the large amount of liquid present in taking a sample typical of that

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[1]This study was part of a Northeast Regional Project (NE-16, Relationship of Nutrient Intake to Nutritional Status in Human Subjects); a cooperative study involving agricultural experiment stations in the Northeastern Region and supported in part by regional funds. Received for publication July 29, 1957.

[2]The authors wish to extend their appreciation to: Pauline Duckett, Chief Dietitian, and the dietary staff of the women's dining room, Mansfield State Training School and Hospital, Mansfield Depot, Connecticut, for cooperation in the collection of dietary data and food samples; to the eighty mentally retarded women who served so cheerfully and cooperatively as subjects; and to Neil A. Dayton, M.D., Superintendent, for making the institution available for the study and for his continued interest and encouragement in this research.

TABLE 1 **Analyzed vs. published values for ascorbic acid**

FOOD	METHOD OF PREPARATION	ASCORBIC ACID			
		Laboratory analyses			Published data (1)
		Samples	Range	Mean	
			mg./100 gm.	*mg./100 gm.*	*mg./100 gm.*
Beans, including green and wax	canned, heated	7	1.9— 6.4	3.8	5
Cabbage	boiled	10	1.6—27.2	13.9	19
	raw, shredded	8	38.4—67.2	49.2	41
Carrots	boiled	10	0 — 6.1	2.9	4
Liver, beef	baked	6	15.4—22.4	19.0	31
Milk	whole, pasteurized	14	1.2— 2.1	1.7	1
Parsnips	steamed	5	4.2—16.3	8.6	12
Peas	canned, heated	8	3.8—16.0	10.6	9
Potatoes	steamed, after peeling	10	7.7—19.5	12.0	14
	mashed	12	0.8—12.5	6.5	7
Rutabagas	steamed, chunks	4	28.0—33.6	29.4	—
	mashed	11	13.9—28.0	21.0	21
Salad, green, no cabbage	raw	6	2.2—18.4	7.6	—
Sauerkraut	canned, heated	7	1.3—15.5	4.5	16
Spinach	canned, heated	6	4.3— 8.6	7.3	14

served to the subjects. The larger retention of ascorbic acid by cooking vegetables in large pieces, without mashing, was noted in both potatoes and rutabagas. Season of the year, however, may have been the greatest factor in the variation of the ascorbic acid value in steamed potatoes (3). The average value for cooked cabbage was lower than the Handbook value, while raw cabbage had generally excellent values, with an average above the Handbook value. However, the majority of cooked cabbage samples retained their ascorbic acid well; the average was affected by two very low samples which were collected late in the winter. The low value of the six samples of mixed green salad without cabbage is of interest.

It is worth noting that our results for canned green beans and canned peas compared favorably with the results of Fisher and Dodds (4), who also used the Roe and Kuether method with norit oxidation. They reported ascorbic acid values of 2.6 mg. per 100 gm. for canned green beans and 9.4 mg. for canned peas, compared to our results of 3.8 mg. for beans and 10.6 mg. for peas.

The higher ascorbic acid values for milk, as compared with the Handbook value, were probably due to our method of analysis. The ascorbic acid in milk is present largely in the oxidized or dehydro form. Thus, total ascorbic acid values are considerably higher than those generally representing only reduced ascorbic acid. Fruits and vegetables, on the other hand, usually containing little dehydro ascorbic acid, provide almost wholly reduced ascorbic acid. By way of comparison with other investigators, Fisher and Dodds (4) reported an average value of 1.2 mg. total ascorbic acid per 100 gm. milk with only 0.4 mg. present in the reduced form. Fincke *et al.* (5) reported an average value of 1.8 mg. total ascorbic acid per 100 cc. pasteurized milk served in the University of Idaho dining hall. Method of pasteurization may have influenced the values. Also, consistent differences were noted each year with the highest ascorbic acid values coming in the early spring when the cows first returned to pasture. The institution maintains its own dairy herd and has its own pasteurization plant.

This report shows that the range of ascorbic acid values for institutionally prepared foods may extend both above and below the average values reported in food tables. Thus the tabular values are not necessarily valid for any one day's food. This report also calls attention to the fact that cooked vegetables, such as cabbage, potatoes, and rutabagas, especially when handled to prevent excessive loss of ascorbic acid, can contribute a substantial part of the recommended dietary allowance for ascorbic acid.

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Food Yields in Institutional Food Service[1]

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INFORMATION ON food yields is needed for guidance and economy in planning and purchasing foods for use both in household and large-quantity food service. Also, data on yields and losses of foods when prepared for serving are basic to the determination of nutritive value of food and to the appraisal of diets. The purpose of this report is to point out some of the practices in preparation which contribute to variation in yield of edible food.

Data on yields and losses of foods during different stages of preparation were obtained by the Human Nutrition Research Division in its own laboratories and from work done under contract with four institutions.[2]

Many data on food yields also were obtained incidental to various laboratory studies in the Human Nutrition Research Division, covering such diversified purposes as development of recipes for institutional, school lunch, and home uses; chemical analysis of the composition of foods; food preservation, including freezing, canning, and dehydration; household utilization in relation to quality of items such as apples, potatoes, meats, and poultry.

Results of these studies have been used as a basis for calculating the number of servings per purchasing unit for inclusion in the *Food Buying Guide for Type A School Lunches* (1) and in *Recipes for Type A School Lunches* (2) recently released to schools participating in the National School Lunch Program. These data also were used, together with results from many other published and unpublished sources, as a basis for values reported in the United States Department of Agriculture publication entitled *Food Yields Summarized by Different Stages of Preparation* (3). In that publication, the average, maximum, and minimum percentage yields of food, the description of the food before and after each preparation step, the description of discarded parts, and the number of samples assembled are shown in tabulated form.

In the contract studies at Drexel Institute, Iowa State College, Yale University, and St. Luke's Hospital, at least three replicate samples of each food from different purchase lots were prepared for serving raw or cooked under conditions usually employed for quantity food service. At Drexel Institute of Technology and Iowa State College, the data were obtained during actual food preparation in girls' residence halls. The other two institutions were large hospitals where food was prepared in large quantities. The amounts of food used in the laboratory studies and in the four institutions varied from a few pounds to several hundred pounds.

The work sheets used for recording data on food yields and losses and detailed instructions for using the work sheets are available from the Human Nutrition Research Division (4). The forms and instruction sheets also are included in the thesis by Ida G. Van Riter at the Drexel Institute of Technology where a study was made of the acceptance by college students of twenty-six of the vegetables on which yield data were obtained for the U.S. Department of Agriculture (5).

This paper will present data on fruits and vegetables while a subsequent paper will deal with yields for meats and poultry.

Fresh Fruits

Data on the percentage yield of raw, prepared fruit, based on weight as purchased, are presented in Table 1.

[1]Presented at the 39th Annual Meeting of The American Dietetic Association in Milwaukee, on October 11, 1956.

[2]Research leaders responsible for supervision of the contract research were: Grace M. Augustine, Ph. D., Iowa State College, Ames; Mildred M. Reynolds, Drexel Institute of Technology, Philadelphia; E. Alliene Mosso, St. Luke's Hospital, New York, New York; and Doris Johnson, Ph.D., Grace-New Haven Community Hospital, Yale University, New Haven, Connecticut.

TABLE 1 Percentage yield of raw prepared fruit and vegetables from weight as purchased

FOOD	WEIGHT AS PURCHASED	YIELD OF RAW, PREPARED FOOD		PARTS DISCARDED OR EXCLUDED
		Average	Range	
Fruits				
	lb.	%	%	
Apples				
Greening	80	73	70— 78	core, peel, bruises
Winesap	34	72	—	core, peel
Avocados	131	60	41— 75	peel, pit, over-ripe spots
Bananas	8	58	—	peel, soft spots
Blackberries	32	96	92—100	cap, spoiled fruit
Blueberries	66	84	68— 99	stem leaves, soft fruit
Cantaloupe				
Served without rind	465	61	45— 74	rind, seeds
Served with rind	94	37	36— 38	rind*, seeds, juice
Cherries				
Served with pit removed	331	79	78— 86	pit, stem, spoiled fruit
Served with pit	14	96	—	stem
Coconut	19	45	—	shell, milk
Cranberries	18	97	93— 99	stem, poor berries
Grapefruit, sections and juice	316	48	41— 64	peel, seeds, membrane
Grapes				
With seeds	45	90	86— 93	stem, seed, defects
With seeds	78	93	89— 96	stem, defects
Seedless	88	95	90— 97	stem, defects
Honeydew melon				
Served without rind	49	54	52— 56	rind, seeds, juice
Served with rind	51	72†	65— 73†	rind*, seeds
Lemon				
Sections	5	48	—	peel, seeds, membrane
Juice	80	46	41— 52	peel, pulp, seeds, membrane
Lime, sections	6	57	—	peel, seeds, membrane
Oranges				
Navel, sections	94	48	47— 49	peel, membrane
Other varieties				
Sections	214	57	43— 66	peel, seeds, membrane
Juice	32	44	—	peel, pulp, seeds, membrane
Peaches				
Elberta	1522	75	54— 89	peel, pit, spoiled fruit
Golden Jubilee	260	81	76— 84	peel, pit, soft fruit
Hale Haven	17	77	73— 79	peel, pit
Sun High	33	85	84— 85	peel, pit
Triagem	36	78	58— 89	peel, pit
Vedette	49	83	68— 94	peel, pit
Others	100	78	72— 85	peel, pit
Pears, Bartlett	203	67	61— 80	peel, core, stem
Pineapple	223	48	40— 52	top, core, peel
Plums				
Stemmed	41	94	91— 96	pit
With stems	195	93	86— 95	stem, pit, spoiled fruit
Raspberries	17	98	94— 99	stem, cap, soft fruit
Strawberries	147	84	60— 98	stem, cap, spoiled fruit
Tangerine	8	66‡	—	peel, seeds
Watermelon				
Firm, ripe	252	46	44— 56	rind, juice, seeds
Over-ripe	59	33	29— 34	rind, juice, seeds, waste pulp
Vegetables				
Asparagus, green	791	51	43— 80	stalks, ends
Beans				
Green	2709	84	72— 96	vines, ends, bad beans, trimmings
Lima	753	35	24— 47	pods, spoiled beans
Wax	11	86	82— 98	stems, beans, ends
Beets				
Whole	49	77	73— 78	stems, roots
Greens	16	59	—	old leaves, stems
Broccoli	623	62	49— 62	leaves, tough stalks, flowers
Brussels sprouts	18	72	71— 73	ends, leaves

Table 1—Concluded

FOOD	WEIGHT AS PURCHASED	YIELD OF RAW, PREPARED FOOD		PARTS DISCARDED OR EXCLUDED
		Average	Range	
Vegetables—(Concluded)				
Cabbage	*lb.*	%	%	
Green	164	79	74— 88	core, leaves, trimmings
Red	336	76	58— 86	core, leaves, trimmings
Carrots	573	76	66— 88	scrapings, ends
Cauliflower	1883	31	13— 56	leaves, core, damaged parts
Celery	417	71	31— 88	ends, tops
Chicory	79	71	56— 90	stems
Corn	876	26	25— 26	husk, silk, ends
Cucumbers	174	72	58— 81	peels, ends
Eggplant	137	78	73— 82	calyx, peels
Escarole	28	74	71— 98	core, leaves
Kale	453	30	25— 60	coarse stems
Lettuce	315	69	53— 93	outside leaves
Mushrooms	166	98	75—100	stems, peels
Mustard greens	31	77	71— 78	stems, bad leaves
Onions				
Mature	204	89	86— 95	skins
Spring	8	53	—	all green above 6 in.
Parsnips	38	67	64— 68	cores, scrapings
Peas, green	1425	37	21— 95	pods, immature peas
Peppers, green	275	78	67— 85	core, seeds
Potatoes	551	84	61— 94	peel, eyes
Pumpkin	690	64	62— 77	peel, seeds
Radishes	85	60	54— 72	ends, trimmings, dirt
Romaine	23	70	61— 86	core, leaf ends
Rutabagas	65	89	84— 92	peel
Spinach	799	36	32— 91	stalks, leaves
Squash				
Acorn	18	66	—	shell, seeds
Crookneck	195	86	85— 98	ends
Hubbard	67	59	57— 63	peel, seeds, bad spots
Patty pan	76	97	98	peel, seeds, trimmings
Zucchini	5	98	—	stems
Sweet potatoes	461	80	78— 80	peel, bad spots
Swiss chard	34	96	72—100	stems, wilted leaves
Tomatoes	952	86	78— 98	ends, damaged parts
Turnips				
Whole	52	80	73— 96	peel
Greens	98	53	31— 55	tough stems
Watercress	10	92	89— 94	ends

*Collected as plate waste
†No juice loss
‡Includes membrane

The small fruits, such as berries and grapes, had the highest percentage yields, with most of the values between 90 and 100 per cent for different lots. After removing stems, caps, and spoiled berries, raspberries had an average yield of 98 per cent; cranberries, 97 per cent; and blackberries, 96 per cent. Strawberries and blueberries were most variable in respect to edible berries, with percentage yields ranging from 60 to 98 for strawberries and 68 to 99 for blueberries. Grapes had yields between 86 and 97 per cent, averaging 95 per cent for the seedless variety, 90 per cent for grapes with seeds when seeds, stems, and defects were removed, and 93 per cent with seeds retained.

Among the single-pit stone fruits, plums with stems had an average yield of 93 per cent after stem, pit, and spoiled fruit were discarded; stemmed plums had an average yield of 94 per cent after removal of pit. Yield for cherries after removal of pit, stem, and spoiled fruit averaged 79 per cent; in a 14-lb. lot, from which only the stem was removed, the yield was 96 per cent. Yield data were available for several varieties of peaches. Elberta peaches had the most variation in yield, from 54 to 89 per cent, with an average of 75 per cent for 1522 lb. fruit. Hale Haven averaged 77 per cent; Triagem, 78; Golden Jubilee, 81; Vedette, 83; and Sun High, 85. Yield for other varieties ranged from 72 to 85 per cent and averaged 78 per cent. Avocados also had a large variation in yield of edible portion from different lots of fruit, from 41 to 75 per cent.

Citrus fruits had average yields between 48 and 66 per cent of sections after removal of peels, seeds,

TABLE 2 **Percentage yield of raw, prepared fruit from weight as purchased in different locations**

FRUIT	YIELD OF RAW, PREPARED FRUIT							PARTS DISCARDED IN ADDITION TO DEFECTIVE PARTS
	Contract studies				Laboratory study, Beltsville, Maryland			
	Ames, Iowa*	Philadelphia, Pennsylvania†	New York, New York‡	New Haven, Connecticut#	Quantity cooking	Food composition	Food preservation	
	%	%	%	%	%	%	%	
Avocados	63—74	—	64—75	41—53	68	69	72	peel, seeds
Blackberries	—	92—96	—	—	96, 98	93	100	caps
Blueberries	—	97—98	96—99	—	95, 96	94	68	stems, leaves
Cantaloupe	—	46—56	59—60	57—74	57, 60	61	45—67	rind, seeds
Cherries	—	82—85	—	—	—	82, 86	78—83	pit, stems
Grapefruit, sections and juice	45—58	47—49	41—44	—	61	59, 64	—	peel, seeds, membrane
Grapes								
Seedless	96	90—95	—	—	—	97	—	stem
Seeded	86, 90	—	—	89—96	—	93	92	stem, seeds
Honeydew melon	—	52—56¶	—	—	65	73	—	rind, seeds, juice
Lemons, juice only	41—46	45—52	—	—	—	—	—	peel, pulp, seeds, membrane
Oranges, sections and juice	47—66	56—63	43—46	—	48	62	—	peel, seeds, membrane
Pears	—	76—78	74	61—64	—	80	80	skin, stem, seeds
Pineapples	47, 52	43—49	47, 48	—	—	—	40, 48	top, peel, core, trimmings
Plums	—	86—91	—	90—95	—	92—96	96	stem, pit
Raspberries	—	94	—	—	99	99	—	stem, cap
Strawberries	—	—	—	86—98	81, 86	90	60—94	stem, cap
Watermelon	—	29—51	—	—	56	44	—	rind, juice, seeds

*Iowa State College.
†Drexel Institute of Technology.
‡St. Luke's Hospital.
#Grace-New Haven Community Hospital.
¶If juice added, range is 53—65. Juice weighed separately in contract studies.

and membrane. Lemons had 48 per cent sections; limes and oranges, 57 per cent. Navel oranges gave an average of 48 per cent sections after removal of peels and membrane. The juice from lemons averaged 46 per cent and from oranges, 44 per cent. Grapefruit sections and juice, which were not determined separately, ranged from 41 to 64 per cent with an average of 48 per cent for 316 lb. grapefruit. Tangerines had 66 per cent of edible fruit with membrane included. Pineapples averaged 48 per cent yield after discarding top, core, and peel, and varied in yields of edible portion from 40 to 52 per cent.

Melons showed wide variation in yields. One lot of honeydews averaged 72 per cent when no juice was lost in preparation, and another lot averaged only 54 per cent. Cantaloupe varied even more. After removal of rind and seeds, the yield of cantaloupe ranged from 45 to 74 per cent. When the rind was collected as plate waste, the average yield of cantaloupe eaten was only 37 per cent. The yield of food from firm-ripe watermelon ranged from 44 to 56 per cent, whereas the yield from over-ripe watermelon ranged from 29 to 34 per cent.

After removal of core and peel, Greening apples gave approximately the same yield as Winesaps, 73 and 72 per cent, respectively. Bartlett pears had an average yield of 67 per cent. Data on bananas were limited to 8 lb. fruit, and the average yield of 58 per cent may therefore not be representative.

To illustrate the variation in data obtainable under different circumstances, the percentage yields for a few fruits were classified in Table 2 according to the source of the data. These figures obtained under the contract studies represent data gathered in regular large quantity food service; the laboratory studies were concerned with research in quantity cooking, food composition, or food preservation.

It can be seen from the data in Table 2 that the yield of edible food from fruits is not uniform for all lots of one variety. The amount of trimming by different workers and for different uses influences the yield. Quality and deterioration are also important factors. Size of pit and thickness of peel may influence the yield, as well as differences in degree of ripeness.

Fresh Vegetables

Yields from vegetables as obtained fresh from the market and cooked for serving are influenced by two steps in their preparation: (a) preparation as raw food, which usually involves discarding or excluding portions of the vegetable, and (b) the cooking process which usually results in varying amounts of cooking losses or gains. The percentage yields of raw and cooked vegetables are presented separately in Tables 1 and 3, respectively.

Among the leafy vegetables, the prepared yields for raw green cabbage ranging from 74 to 88 per cent were high as compared with kale, spinach, and

turnip greens. Spinach had the widest range in yield from different purchased lots, with a minimum yield of 32 and a maximum of 91 per cent. Lettuce also had a wide range in yields in each institution where it was used. Chicory and escarole were other vegetables with fairly wide ranges in yields. Watercress had a high yield with a narrower range of values.

For the pods, green peas had a large variation in yield of raw prepared food, from 21 to 95 per cent for 1425 lb. of peas used in these studies. The yield for Lima beans varied from 24 to 47 per cent, but the average was about the same as for peas, 35 per cent for Lima beans compared with 37 per cent for peas. The yields for green and wax beans were relatively high, 84 and 86 per cent, excluding only stem ends and trimmings.

Roots, tubers, and bulb vegetables had three levels of average yields. Onions, potatoes, rutabagas, sweet potatoes, and turnips had average yields between 80 and 89 per cent. Average yields for carrots and beets of 76 and 77 per cent respectively, are reported. Parsnips and radishes had averages in the sixties. Wide variation in the various groups was noted. White potatoes had a minimum yield of 61 per cent, a maximum of 94 per cent, and an average of 84 per cent for 551 lb. Peeling methods, i.e., mechanical- vs. hand-peeling, and variety are known to be important factors in potato yields. Carrots had percentage yields ranging from 66 to 88, radishes from 54 to 72 per cent.

The vegetables classified as stalks and flowers (asparagus, broccoli, cauliflower, and celery) varied widely in the yields from different lots and in different locations. It would be difficult to predict how many servings you would get from 100 lb. of most of these vegetables when the range in yield is great. For asparagus, for example, yields ranged from 43 to 80 per cent. It may be wise to pay a little more for asparagus with green and tender usable stalks than to buy asparagus with woody stalks at a lower price. The average yield for celery was 71 per cent, but the range was from 31 to 88 per cent.

Other vegetables with extreme percentage yields were: Swiss chard with a range from 72 to 100 per cent yield and mushrooms with a range from 75 to 100 per cent yield of usable food.

When fresh vegetables were cooked, some lost and others gained weight as shown in Table 3. Many, however, did not change appreciably in weight—not more than plus or minus 10 per cent—as a result of cooking. Those which gained more than 10 per cent and up to 27 per cent were Brussels sprouts cooked by boiling, collards, kale, and okra cooked by boiling or steaming. Those which lost more than 10 per cent and up to 45 per cent in weight on cooking were beet greens, mustard greens, spinach, Swiss chard, and turnip greens among

TABLE 3 Percentage yield by weight of cooked vegetable from ready-to-cook weight

VEGETABLE	METHOD OF COOKING	READY-TO-COOK WEIGHT	YIELD OF COOKED EDIBLE FOOD
		lb.	%
Asparagus, green	boil	16	91
	steam	92	94
Beans			
Green	boil	44	100
	steam	55	96
Lima	boil	23	105
	steam	54	99
Wax	boil	75	92
Beets			
Whole	boil	60	71
	steam	139	70
Greens	boil	12	78
Broccoli	boil	49	93
	steam	177	94
Brussels sprouts	boil	4	111
	steam	57	106
Cabbage			
Wedges	boil	124	93
	steam	43	97
Shredded	boil	350	87
	steam	154	93
Carrots	boil	36	93
	steam	78	90
Cauliflower	boil	39	98
	steam	281	102
Celery	boil	77	83
	steam	256	99
	sauté	46	64
Collards	boil	10	115
	steam	10	116
Corn	boil	84	100
	steam	169	102
Eggplant	steam	15	93
Kale	boil	21	111
	steam	33	123
Mustard greens	boil	6	58
Okra	boil	7	123
	steam	2	111
Onions	boil	313	90
	steam	149	84
	bake	16	84
Parsnips	boil	39	101
	steam	30	97
Peas, green	boil	50	97
	steam	49	97
Potatoes	boil	107	98
	boil*	9	90
	steam	163	94
	steam*	26	90
	country fry	9	52
Rutabagas	boil	46	97
	steam	215	90
Spinach	boil	64	68
	steam	19	97
Squash			
Acorn	steam	7	77
	bake	7	77
Crookneck	boil	33	76
	steam	327	88
Hubbard	boil	10	86
	steam	47	84
	steam	18	64
	bake	11	59
Patty pan	boil	74	71
Zucchini	boil	15	84
	steam†	250	92
	steam	60†	45‡
Sweet potatoes	boil*	41	84
	steam*	229	72
	steam	131	66
Swiss chard	boil	49	88
	steam	21	63
Turnips			
Whole	boil	30	99
	steam	48	87
Greens	boil	4	75

*Peel included
†Seeds and peel included
‡Seeds and peel removed

the leafy vegetables; beets, celery, onions, several types of squash, sweet potatoes, turnips, and fried potatoes. The loss in weight may be attributed to the method of cooking in some cases, i.e., in baking and frying more moisture is lost, and to the nature of the vegetables in other cases. The yield by weight after cooking was 20 to 30 per cent lower than the ready-to-cook weight for some vegetables. This is a loss which must be considered when estimating the number of pounds to buy to feed 100 or 1000.

Thus, yields of fruits and vegetables prepared for serving vary greatly with the condition, quality, size, variety, and maturity. Loss in preparation of fruits and vegetables may vary also with intended use in food preparation or preservation. Average figures do not indicate this variation in yield.

Summary

Data on the yield of usable food from twenty-three fresh fruits, forty-three fresh vegetables, and thirty-three cooked vegetables have been presented. Factors affecting yield are discussed. Ranges of yield in some cases were great, indicating that averages might be misleading if used as the basis for purchasing for a given number of servings.

References

(1) AGRIC. MARKETING SERV.: Food Buying Guide for Type A School Lunches. U.S.D.A. PA-270, 1955.

(2) AGRIC. MARKETING SERV.: Recipes—Type A School Lunches. U.S.D.A. PA-271, 1955.

(3) PECOT, R. K., AND WATT, B. K..: Food Yields Summarized by Different Stages of Preparation. U.S.D.A. Agric. Handbook No. 102, 1956.

(4) HUMAN NUTRITION RESEARCH DIVISION: Work sheets and instructions for using work sheets on yields and losses of food during preparation. U.S.D.A., processed.

(5) VAN RITER, I. G.: A study of the acceptance of twenty-six vegetables served at Sarah Drexel Van Rensselaer Dormitory. M.S. thesis, Drexel Inst. Tech., 1955.

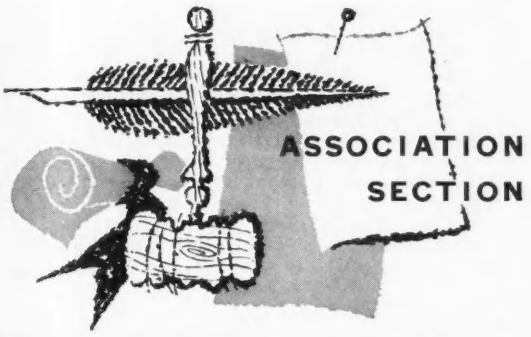
Intrastaff Communication

The word "communication" has now become almost a shibboleth. In almost every professional field—not alone those represented in public health—there's lively talk about communication. As never before, the processes of communication and the conditions under which it takes place are being studied. Too frequently in the past, I fear, have too many public health workers—in thinking about or in being concerned with practical applications—dealt chiefly, if not exclusively, with the *how* of communication. The *how* is important, but not as important as the *why*. Do we need to give more thought to the why each time we employ communication in each aspect of our daily work?

"Communication" *per se* is an extremely broad and complex subject. This is so regardless of how much one arbitrarily attempts to limit the communications factors for discussion to those *within* an organization. The external and internal forces, the media, the channels, the purposes, the problems, the ways and means involved in good communications maintenance cannot be so capriciously confined.

The administrator or the office and field practitioner within an organization today who looks upon communication simply as a matter of issuing a directive or statement of information is open to disappointment in the response elicited. Conversely, the administrator with habitual willingness to permit careful and considered observation of each situation's symptoms in order to reach a diagnosis *before* prescribing therapy for a communications problem is the more likely to gain the response and objective anticipated. Arriving at such diagnosis and appropriate therapy more often than not requires patience and willingness for consultation, perhaps "laboratory" confirmation *before* decision and action. Most intrastaff communications ills are *not* emergencies. They are more likely to be chronic than acute. Most are preventable.

We need to keep in mind in intrastaff communication that chief emphasis must be on the persons concerned rather than on the medium or material. Good communication is personal, carried on in a climate of mutual trust. A symbol for effective communication may be thought of as a round-table at which people are relating themselves to each other. There is no hierarchial head. There is no fixed leader, but leads are being given and received by each. The expert may be there, but the expert is on *tap*, not on *top*. No one—not even an expert—can give appropriate answers until given the questions. In such a network of mutuality, the lines of communication are down less frequently and the messages are less likely to be misheard or misread.—*Chester S. Bowers, Director of Bureau of Public Health Education, Connecticut State Department of Health, Hartford, speaking before a joint session of Dental, Health, Food and Nutrition, Health Officers, Public Health Education, and Public Health Nursing Sections of the American Public Health Association in Cleveland on November 15, 1957.*



Report of the Nominating Committee, The American Dietetic Association, 1957-58[1]

THE NOMINATING Committee of The American Dietetic Association—Jean Crooks, Vivian L. Laird, Margaret Warde, Mary Zahasky, and Corinne H. Robinson, Chairman—presents the following ballot for 1958-59:

PRESIDENT-ELECT

Doris Johnson: B.S., M.S., Ph.D., University of Wisconsin; dietetic internship, The Johns Hopkins Hospital, Baltimore

POSITIONS HELD:

Dietitian, St. Joseph's Hospital, Milwaukee
Research Assistant, Department of Home Economics, University of Wisconsin
Dietitian, Wisconsin State Sanatorium, Statesan
Dietitian, Edward J. Hines Memorial Hospital, Hines, Ill.
Ward Supervisor and Teaching Dietitian, Presbyterian Hospital, New York City
Assistant Professor, Foods and Nutrition, School of Home Economics, University of Wisconsin
Present position: Director of Dietetics, Grace–New Haven Community Hospital, and Assistant Professor, Department of Public Health, Yale University School of Medicine, New Haven, Conn.

PROFESSIONAL ACTIVITIES:

Treasurer and Chairman, Finance Committee, A.D.A.
Chairman, Diet Therapy Section, A.D.A.
Chairman, Journal Board, A.D.A.
Chairman, Nominating, Diabetic Diet Calculations, and Study of Life Membership Committees, A.D.A.
Member, A.D.A.–American Medical Association Joint Committee on the Bland Diet
A.D.A. delegate, National Health Council
President, Connecticut Dietetic Assn.
Member, Nutrition Committee, American Heart Assn.
Vice-Chairman, Connecticut Nutrition Council
Member: American Assn. for the Advancement of Science, American Home Economics Assn., American Public Health Assn., American Heart Assn., Quota Club, Phi Upsilon Omicron, Omicron Nu, Phi Kappa Phi, Sigma Xi, Sigma Epsilon Sigma, Sigma Delta Epsilon

PUBLICATIONS:

Author: *Modern Dietetics, Overweight Is Curable, A Laboratory Manual in Cookery*
Papers in this JOURNAL, *American Journal of Clinical Nutrition*, and other professional publications

SPEAKER-ELECT OF THE HOUSE OF DELEGATES

Edith A. Jones: B.S., University of Alabama; M.S., University of Tennessee; dietetic internship, The Johns Hopkins Hospital, Baltimore

POSITIONS HELD:

Assistant in Charge of Main Kitchen, The Johns Hopkins Hospital
Army dietitian in U.S. and England
Dietitian in Charge of Pediatric Section, and Dietitian in Charge of Student Curriculum, School of Dietetics, The Johns Hopkins Hospital
Nutritionist, Nutrition Branch, Division of Chronic Disease, and Dietitian Consultant, Division of Hospital facilities, U.S. Public Health Service, Washington, D. C.
Present position: Chief, Nutrition Department, Clinical Center, National Institutes of Health, Bethesda, Maryland

PROFESSIONAL ACTIVITIES:

Member, Coordinating Cabinet, A.D.A.
Member, Council of the House of Delegates, A.D.A.
Delegate, A.D.A.
Chairman, Nominating Committee, A.D.A.
Chairman and Co-Chairman, Program Planning Committee, A.D.A.
Chairman, Food Administration Section Project, A.D.A.
President, District of Columbia Dietetic Assn.
President-Elect, Maryland Dietetic Assn.

PUBLICATIONS:

Papers in this JOURNAL and other hospital publications

Marjorie M. Morrison: B.S., Florida State College for Women; M.S., University of Tennessee

POSITIONS HELD:

Teacher, Brooksville (Fla.) High School
Teacher, Gainesville (Fla.) High School
Nutritionist, Florida Board of Health, Jacksonville
Nutritionist, U.S. Public Health Service, Grand Haven, Mich.
Director, Springfield (Mass.) Nutrition Service Bureau
Present position: Chief Nutrition Consultant, Florida Board of Health, Jacksonville

PROFESSIONAL ACTIVITIES:

Chairman, Community Nutrition Section, A.D.A.
Member, Coordinating Cabinet, A.D.A.
Delegate, A.D.A.
President, Florida Dietetic Assn.
President and Secretary, Jacksonville Dietetic Assn.
President-Elect, Assn. of State and Territorial Public Health Nutrition Directors
Chairman, Food and Nutrition Section, Southern Branch, American Public Health Assn.
Member, Nutrition Practices and Nutrition Information Committees, Food and Nutrition Section, American Public Health Assn.
Secretary and Counselor, Florida Home Economics Assn.

[1] Other nominations may be made by nomination petitions signed by not less than 400 members of the Association, of whom not more than 30 shall be from any one state, assented to in writing by the person or persons named thereon as nominees, and filed with the Secretary at the office of the Association on or before April 15, 1958.

SECRETARY

Martha Jane Moffit: B.S., Iowa State College; M.S., State University of Iowa; dietetic internship, California Hospital, Los Angeles

POSITIONS HELD:
- Kitchen Supervisor, Chicago Home for Girls
- Dietitian, Rockford (Ill.) Hospital
- Assistant Dietitian, Asheville (N. Car.) Normal and Teachers College
- Dietitian, Iowa Soldiers Home, Marshalltown
- Dietitian, Good Samaritan Hospital, Cincinnati
- Chief, Dietetic Service, VA Hospital, Tuscaloosa, Ala.
- Instructor in Dietetics, VA Hospital, Hines, Illinois
- Present position: Dietetic Specialist in Training, Dietetic Service, Veterans Administration, Washington, D. C.

PROFESSIONAL ACTIVITIES:
- Member, Hospital Internship Board, A.D.A.
- Chairman and Co-Chairman, Program Planning Committee, A.D.A.
- Chairman, Educational Exhibits, A.D.A.

Margaret L. Ross: B.S. Ed., State Teachers College, Framingham, Mass.: A.M., Teachers College, Columbia University; Ph.D., The Pennsylvania State University; dietetic internship, University of Michigan Hospital, Ann Arbor

POSITIONS HELD:
- Assistant Dietitian, University of Michigan Hospital
- Dietitian, Monmouth Memorial Hospital, Long Branch, N. J.
- Dietitian, Albany (N.Y.) Hospital
- Chief Dietitian, Hurley Hospital, Flint, Mich.
- Director of Professional Activities, The American Dietetic Assn., Chicago
- Research Assistant and Graduate Student, Teachers College, Columbia University and Pennsylvania State University
- Assistant Professor of Foods and Nutrition, Iowa State College
- Present position: Professor of Nutrition and Director, School of Home Economics, Simmons College, Boston

PROFESSIONAL ACTIVITIES:
- Chairman, Education Section, A.D.A.
- Member, Coordinating Cabinet, A.D.A.
- Member, Awards, Scholarship, and Loan Fund Board, A.D.A.
- Recipient of Mary Swartz Rose Fellowship of A.D.A.
- Section Chairman, Michigan Dietetic Assn.
- Section Co-Chairman, Massachusetts Dietetic Assn.
- Chairman of State Membership, Dept. of Home Economics, National Education Assn.

PUBLICATIONS:
- Papers in this JOURNAL and the *Journal of Nutrition*

DELEGATE-AT-LARGE

Betty Ann Darcey: B.S., St. Mary College, Xavier, Kans.; dietetic internship, Charity Hospital, New Orleans

POSITIONS HELD:
- Therapeutic and Chief Dietitian, Will Rogers Memorial Hospital, Oklahoma City
- Present position: Chief, Dietetic Service, VA Hospital, Oklahoma City

PROFESSIONAL ACTIVITIES:
- Delegate, A.D.A.
- President and Treasurer, Oklahoma Dietetic Assn.

Ruth E. Silvester: B.S., University of Akron; dietetic internship, Massachusetts General Hospital, Boston

POSITIONS HELD:
- Dietitian, Massachusetts General Hospital
- Dietitian, Middlesex (Conn.) Hospital
- Present position: Chief Dietitian, Allegheny General Hospital, Pittsburgh

PROFESSIONAL ACTIVITIES:
- Delegate, A.D.A.
- Member, Committee to Study the Food Service Supervisor, A.D.A.
- President and Treasurer, Pennsylvania Dietetic Assn.
- President and Treasurer, Pittsburgh Dietetic Assn.
- Chairman, Planning Committee for Course for Food Service Supervisors, Pittsburgh Dietetic Assn.
- Chairman, Liaison Committee of Penssylvania Dietetic Assn. and Hospital Assn. of Pennsylvania

Lorraine G. Weng: B.A., M.A., State University of Iowa; dietetic internship, Montefiore Hospital, New York City

POSITIONS HELD:
- Assistant Dietitian, West Jersey Hospital, Camden, N. J.
- Clinic Dietitian, Bobs Roberts Hospital, University of Chicago Clinics
- Instructor in Nutrition, University of Illinois College of Medicine, Chicago
- Present position: Program Consultant, National Dairy Council, Chicago

PROFESSIONAL ACTIVITIES:
- Member, Journal Board, A.D.A.
- Member, History of Nutrition and Dietetics Committee, A.D.A.
- Chairman, Diet Therapy Section Projects, A.D.A.

PUBLICATIONS:
- Papers in this JOURNAL and other professional publications

NOMINATING COMMITTEE

The following candidates (five of whom are to be elected) for the Nominating Committee for 1958–59 have been selected as representatives of five geographic areas determined on the basis of distribution of the membership. Members are to vote for one person from each geographic area.

Geographic Area I[1]

Miriam E. Lowenberg: Ph.D., University of Chicago; M.S., Iowa State College, Ph.D., State University of Iowa

POSITIONS HELD:
- Teacher, high schools and small colleges
- Assistant Professor, Foods and Nutrition and Child Development, Iowa State College
- Chief Nutritionist, Kaiser Child Service Dept., Kaiser Co., Inc., Portland, Ore.
- Nutritional Supervisor, Rochester (Minn.) Child Health Institute, Mayo Clinic
- Present position: Head, Department of Foods and Nutrition, The Pennsylvania State University

PROFESSIONAL ACTIVITIES:
- Delegate, A.D.A.
- Member, Journal Board, A.D.A.

[1] Geographic Area I: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, and Pennsylvania.

Co-Chairman, Program Planning Committee, A.D.A.
Member, Joint Committee on School Lunch of American Home Economics Assn., American School Food Service Assn., and A.D.A.
President, Pennsylvania Dietetic Assn.
President, Omicron Nu

Frances L. Ware: Certificate, Lindenwood College; A.B., University of Illinois; dietetic internship, Barnes Hospital, St. Louis

POSITIONS HELD:
Assistant Dietitian and Acting Chief Dietitian, Barnes Hospital
Administrative Assistant Dietitian and Director of Dietetics, St. Luke's Hospital, Chicago
Present position: Director of Dietetics, Rhode Island Hospital, Providence

PROFESSIONAL ACTIVITIES:
President, Career Guidance Chairman, and Section Committee Chairman, Rhode Island Dietetic Assn.

Geographic Area II[3]

Katherine H. Andrews: B.S., Western Reserve University; dietetic internship, Peter Bent Brigham Hospital, Boston

POSITIONS HELD:
Staff Dietitian, Cleveland Clinic Hospital
Present address: Silver Spring, Maryland

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President, District of Columbia Dietetic Assn.

Frances O. Hazzard: B.S., Texas State College for Women; dietetic internship, New York Hospital, New York City

POSITIONS HELD:
Dietitian, VA Hospital, Biloxi, Miss.
Head Dietitian, VA Center, Shreveport, La.
Chief Dietitian, Schumpert Memorial Sanitarium, Shreveport, La.
Dietetic Consultant, Shreveport, La.
Present position: Chief, Dietetic Service, Confederate Memorial Medical Center, Shreveport, La.

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Secretary, Louisiana Dietetic Assn.
Vice-President, Career Guidance Chairman, and Public Relations Chairman, Shreveport Dietetic Assn.

Geographic Area III[4]

Mary Reeves: B.S., Tarkio (Mo.) College; graduate work, University of Chicago; M.P.H., Harvard University School of Public Health

POSITIONS HELD:
Staff Dietitian, Presbyterian Hospital, Chicago
Staff Dietitian, California Lutheran Hospital, Los Angeles
Dietitian, Board of Education, Long Beach, Cal.
Community Nutritionist, St. Joseph, Mo.
State Nutrition Consultant, Mo. Division of Health, Jefferson City
Present position: Regional Nutrition Consultant, Children's Bureau, Department of Health, Education, and Welfare, Chicago

PROFESSIONAL ACTIVITIES:
Speaker of the House of Delegates, A.D.A.
Chairman, Community Nutrition Section, A.D.A.
Member, Coordinating Cabinet, A.D.A.
Delegate, A.D.A.
Chairman, Educational Exhibits Committee, A.D.A.
Member, Committee to Study the Professional Position of the Dietitian, A.D.A.
A.D.A. representative and Director, American Assn. for Maternal and Infant Health
President-Elect, Missouri Dietetic Assn.
Member of Council, Food and Nutrition Section, American Public Health Assn.

Grace L. Stumpf: B.S., Milwaukee-Downer College; M.S., University of Wisconsin; dietetic internship, University of Michigan Hospital, Ann Arbor

POSITIONS HELD:
Dietitian, Hopemont (W. Va.) Hospital
Dietitian, Blodgett Memorial Hospital, Grand Rapids
Army dietitian in U.S., North Africa, Italy, and France
Administrative Dietitian, VA Center, Los Angeles
Chief, Dietetic Service, VA Hospital, Ann Arbor, Mich.
Present position: Director of Dietetics, The Ohio State University Hospital, Columbus

PROFESSIONAL ACTIVITIES:
A.D.A. representative, National Food and Beverage Sanitation Conference
President, Los Angeles Region, California Dietetic Assn.
Secretary, Western Michigan Dietetic Assn.

Geographic Area IV[5]

Dagmar W. Tuomin: B.S., Milwaukee-Downer College; dietetic internship, Vanderbilt University Hospital, Nashville

POSITIONS HELD:
Dietitian, Vanderbilt University Hospital
Dietitian, Milwaukee County General Hospital
Army dietitian overseas
Chief Dietitian, Milwaukee County General Hospital
Present position: Dietetic Supervisor, Milwaukee County Institutions

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
President, Section Chairman, and Career Guidance Chairman, Wisconsin Dietetic Assn.
President, Treasurer, Section Chairman, and Career Guidance Chairman, Milwaukee Dietetic Assn.

Floy Eugenia Whitehead: B.S., M.S., University of Georgia; D.Sc., Harvard University

POSITIONS HELD:
Assistant Professor of Home Economics, West Georgia College
Assistant Education Director, Ga. Dept. of Public Health
Associate Professor of Home Economics and Associate Home Economist, Louisiana Agricultural Experiment Station, Louisiana State University
Research Assistant and Visiting Lecturer, Harvard School of Public Health
Director of Nutrition, Wheat Flour Institute, Chicago

[3] Geographic Area II: New Jersey, Delaware, Maryland, Washington, D. C., Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, West Virginia, Tennessee, Kentucky, Arkansas, and Louisiana.

[4] Geographic Area III: Michigan, Ohio, Indiana, and Illinois.

[5] Geographic Area IV: Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas.

Director of Nutrition Education, National Dairy Council, Chicago
Present position: Professor and Chairman, Department of Home Economics, State University of Iowa

PROFESSIONAL ACTIVITIES:
Recipient of Lydia J. Roberts Essay Award of A.D.A.
Member, History of Nutrition and Dietetics Committee, A.D.A.
Chairman, Research Committee, Iowa Dietetic Assn.

PUBLICATIONS:
Papers in this JOURNAL

Geographic Area V[6]

Margret Ann Barksdale: B.S., University of California, Berkeley; dietetic internship, Massachusetts General Hospital, Boston

POSITIONS HELD:
Instructor in Dietetics, Rhode Island Hospital, Providence
Nutrition Research Assistant, University of California, Berkeley
Therapeutic Dietitian, Highland Alameda Hospital, Oakland, Cal.
Consultant Nutritionist, Lily-Tulip Cup Corp., Los Angeles
Chief Dietitian, Santa Fe Hospital, Los Angeles
Head Ward Dietitian, VA Center, Los Angeles
Dietitian, Our Lady of Perpetual Help Hospital, Santa Maria, Cal.
Assistant Director of Food Service, University of California Hospital, Los Angeles
Present position: Director of Food Service, University of California Hospital, Los Angeles

PROFESSIONAL ACTIVITIES:
Delegate, A.D.A.
Treasurer and Chairman, Education Committee, California Dietetic Assn.

Marguerite L. Pettee: B.S., Elmira (N.Y.) College; M.S., University of Chicago; dietetic internship, Presbyterian Hospital, New York City

POSITIONS HELD:
Associate Home Demonstration Agent, Concord, Mass.
County Home Demonstration Agent, Northampton, Mass.
Chief Nutritionist, Medical College of Virginia Clinics, Richmond
Present position: Nutritionist, University of Colorado Medical School, Denver

PROFESSIONAL ACTIVITIES:
Speaker of the House of Delegates, A.D.A.
Secretary and Chairman, Membership Committee, A.D.A.
Chairman, Diet Therapy Section, A.D.A.
Member, Coordinating Cabinet, A.D.A.
Delegate, A.D.A.
Member, Program Planning and Diabetic Diet Calculations Committees, A.D.A.
President, Colorado Dietetic Assn.

[6] Geographic Area V: Hawaii, Washington, Oregon, California, New Mexico, Arizona, Idaho, Utah, Nevada, Montana, Wyoming, and Colorado.

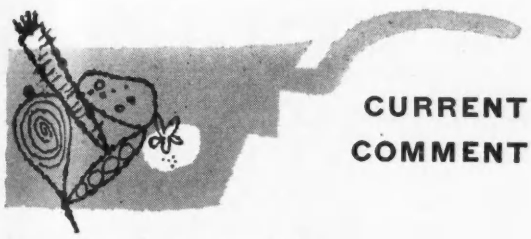
Amino Acid Studies in Kwashiorkor

Six papers, comprising the proceedings of the 13th annual conference on protein metabolism, sponsored by the Bureau of Biological Research of Rutgers University, have been edited by William H. Cole and published under the title, Amino Acid Malnutrition *(New Brunswick, New Jersey: Rutgers University Press, 1957. Paper. Pp. 98. Price $2). Because of the importance of each paper to all investigators in the field of protein metabolism, they will be reviewed separately as space allows. The paper, "Amino Acid Mixtures in Human Nutrition" by E. E. Howe, J. F. Brock, and J. D. L. Hansen, Merck, Sharp and Dohme Research Laboratories, University of Cape Town, and Groote Schuur Hospital, Cape Town, South Africa, is reviewed below.*

The methods of preparation of amino acid solutions for parenteral use are described. These include solutions of essential amino acids and protein hydrolysates, as well as phenylalanine-free casein hydrolysate, for use in the treatment of patients with phenylketonuria. The Phenylalanine-free hydrolysate has been found to prevent the mental deterioration which accompanies this disease.

In studies of the etiology of kwashiorkor, these workers attempted to demonstrate which amino acids were involved in the deficiency or imbalance. For these studies, they used mixtures of pure amino acids, amino acid-supplemented corn proteins, and amino acid-supplemented African corn meal. The mixtures of amino acids were effective in initiating a cure, but nitrogen balance data showed 25 per cent of the nitrogen to be eliminated in the feces. Although the supplemented corn protein concentrate was not dissimilar in composition to the amino acid mixtures, in no case was a cure initiated. Nitrogen balance data showed an 85 per cent loss in the feces. These results suggest that a controlling factor may be the unavailability of the amino acids of the plant proteins.

The authors suggest other possible developments in human use of amino acid mixtures and the possible potential for good in amino acid imbalances if we can find out how to use them.—*May S. Reynolds, Ph.D., Professor of Foods and Nutrition, School of Home Economics, University of Wisconsin, Madison.*



CURRENT COMMENT

New Booklets for Patients on Sodium Restriction[1]

BETH HEAP and CORINNE ROBINSON

Heart Disease Control Program, Division of Special Health Services, Bureau of State Services, Public Health Service, U.S. Department of Health, Education, and Welfare, Washington;
and *Department of Food and Nutrition, College of Home Economics, Drexel Institute of Technology, Philadelphia*

PROBABLY EVERY professional person concerned with the care of patients with congestive heart failure or other cardiac disorders has at some time been aware of the difficulties which prevent the patient from receiving the maximum benefits from his sodium-restricted diet. Our limited data on the sodium content of food and water, for example, have reduced the actual effectiveness of prescribed diets. The scarcity of comparable basic dietary plans has been another limiting factor.

In addition, patients have often been hindered in following their diets because of the lack of understandable information and insufficient counseling services. Physicians and dietitians have deplored this dilemma, since it is basic to sodium-restricted therapy that the patient himself assume a major responsibility in following his diet.

Attempts to help the patient in this respect have been made by numerous groups and individuals. As a result, many diet materials (1), such as meal plans, recipes, manuals for patients and physicians, have been developed, and in some areas, counseling services for patients have been established.

To a certain extent these publications have helped. However, inconsistencies in terminology, inadequacies in description of diets, and misinterpretation of available data have tended to complicate the situation further. Such factors have also served to re-emphasize the need for adequate and simplified instruction booklets for patients and have prompted the professions to think in terms of a cooperative approach to the problem.

Consequently, five major health agencies agreed in 1955 to sponsor the preparation of new booklets for patients. The participating groups were: American Heart Association, The American Dietetic Association, Council on Foods and Nutrition of the American Medical Association, The Nutrition Foundation, and the Public Health Service. The Nutrition Committee of the American Heart Association recommended that the levels of sodium for the diets be 500 mg., 1000 mg., and a "mild" restriction. Using these levels of sodium, a small working committee compiled the basic information for three booklets, which was reviewed and approved by a committee representing the sponsoring groups. This material was put into popular form and has just been published by the American Heart Association.

Previous Publications

Five or six related projects were of particular influence in determining the content, format, and method of presenting the information in these booklets. *Planning Low Sodium Meals* (2, 3) should perhaps be mentioned first. This was published in 1951 by the Health Department of Newton, Massachusetts in a cooperative project with the Public Health Service and under the auspices of several community health groups. Publication was later taken over by The Nutrition Foundation. It is similar to the booklet, *Meal Planning with Exchange Lists* (4), in that the fundamental plan is based on the grouping of essential foods into six groups called "exchange lists" (5). These lists provide the patient with a guide in planning, selecting, and preparing his food within the boundaries of his dietary prescription. The booklet contains no specific diets and is intended to be used in conjunction with dietary counseling.

Food for Your Heart (6), a manual for patient and physician, was published a year later by the American Heart Association. This booklet includes diets at three levels of sodium restriction, as well as much basic information. Experience has shown that many patients require additional help in understanding the instructons, however.

Labeling regulations, to protect and assist persons on prescribed sodium restriction, grew out of actions initiated in 1953 by the Food and Drug Administration. Two regulations, now in effect, require that: (a) all labels of frozen vegetables must declare the presence of salt whether added directly or indirectly (7); and (b) all labels of dietetic foods intended for use on sodium-restricted diets must indicate the actual sodium content in milligrams of sodium for 100 gm. food and in an "average" serving of the food (8).

Another event of far-reaching importance was the publication in 1954 of a comprehensive report by the National Research Council (9). This report reviewed the evidence on the efficacy of sodium-

[1]Adapted from a talk at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 23, 1957.

restricted diets and presented a summary of the clinical and dietary conditions that would indicate their use. This report has contributed much toward a better understanding of the usefulness and limitations of sodium-restricted therapy.

The Public Health Service in 1955 conducted a brief evaluation study (10) on the use of the booklet *Planning Low Sodium Meals* by patients. Although this booklet has been widely regarded as a good example of nutrition education material, most of the patients in the study failed to understand and carry out the dietary instructions correctly. Weak points in the educational approach were identified, so that they would not be repeated.

In 1956 a committee of The American Dietetic Association prepared a modification of the six exchange lists to include sodium restriction (11). This modification was adapted for use in setting up the food groups for the three new booklets on sodium-restricted diets.

The Three New Booklets

With the guidance of these background materials and reported experience in their use, and with assistance from several research laboratories, the three new diet booklets were prepared. Designed principally for use by non-hospitalized adult cardiac patients, they are entitled: *Your 500 Milligram Sodium Diet—Severe Sodium Restriction; Your 1000 Milligram Sodium Diet—Moderate Sodium Restriction;* and *Your Mild Sodium-Restricted Diet.*

The 500-mg. sodium diet is a severe restriction and is the lowest practical level for use outside the hospital. Occasionally, when an even more rigid restriction may be necessary, the sodium can be dropped to about 250 mg. by making only one change in the basic dietary plan—the substitution of 2 c. low-sodium milk for the 2 c. regular milk.

The 1000-mg. sodium diet (moderate restriction) employs the basic plan of the 500-mg. sodium diet, but permits the daily addition of ¼ tsp. salt. If the physician objects to the use of free salt, 500 mg. sodium can be provided by suitable units of salted bread and/or butter. This makes the diet somewhat more palatable and may be a deciding factor in obtaining the patient's adherence to his diet.

The mild sodium-restricted diet has no designated level of sodium. The patient can achieve a mild restriction by following three basic rules: (a) foods may be lightly salted in cooking, provided no salt has been added previously in their processing; (b) salt may not be used at the table, and (c) salt-preserved and highly salted foods must be avoided. "Lightly salted" is defined on the basis of the individual's past food-salting habits. That is, he is instructed to use no more than half the amount he formerly used.

Each of these three booklets contains basic information designed to give the patient a clear understanding of the principles of sodium restriction, as well as detailed instruction to assist him in correctly carrying out his prescribed diet.

Chapter I of each booklet answers such questions as: "What is sodium?" "Where does the body get its sodium?" "How is it measured?"

The grouping of foods into lists is explained in Chapter II. The groups are essentially the same as the six diabetic exchange lists, with the necessary adjustments for sodium restriction. However, the word "unit" is used instead of "exchange."

The milk group (List 1) is divided into two sections. The first, intended for use on the 1200-calorie diet, includes skim milk, thus making it possible for the patient to select one "free-choice" unit. This dietary pattern also assures a low-fat regimen if prescribed. The second section of milk units, intended for the 1800- and unrestricted-calorie diets, includes whole milk. Provision is also made in the milk list for substituting 1 meat unit for 1 milk unit. Physicians and dietitians are aware, of course, that such substitution reduces appreciably the calcium intake and that a daily intake of 800 mg. may not be achieved. They may wish to limit such substitution to infrequent occasions. On the other hand, it should be borne in mind that the calcium requirement of the adult is by no means definitely established at 800 mg. (12).

List 2 includes a group of vegetables—corn, dried legumes, potatoes — which will be recognized as those listed with the bread exchanges in *Meal Planning with Exchange Lists* (4). These vegetables may still be alternated with the bread units, but it is felt that this re-grouping is more logical from the standpoint of food classification.

A seventh list called "Free Choice" units has been added, representing sweets, such as jellies and sugars, and selections from the vegetable, fruit, bread, and fat units. It permits the patient to make some choice without overstepping his dietary limits. Each "Free Choice" unit provides 75 calories, but does not appreciably raise the sodium level.

Dietary plans at 1200-, 1800-, and unrestricted-calorie levels are provided for each level of sodium. The 1200-calorie diet plan consists of:

2 units (1 pt.) regular milk
1 unit from each of the three vegetable groups
4 units from the fruit list
5 units from the bread list
5 units from the meat list,
1 unit from the "Free Choice" list.

Chapter III discusses the importance of weight control, emphasizing the responsibilities of the patient himself.

Step-by-step, illustrated directions for meal planning and sample menus for two days for diets at

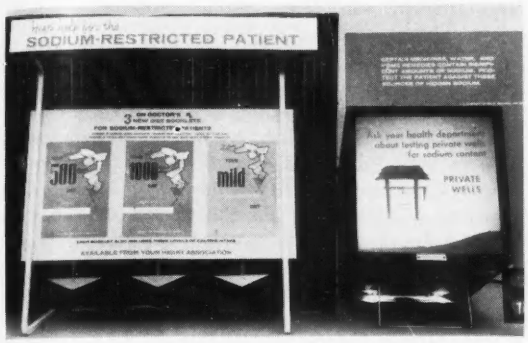


Table-top exhibit which may be borrowed from state and local heart associations

each caloric level are presented in Chapter IV, while suggestions for eating away from home are given in Chapter VI.

Chapter V is for the cook. General instructions for food preparation are given and suggested flavoring aids are listed, but specific recipes are not included[2]. Questions concerning such subjects as low-sodium cook books and low-sodium products are discussed. The patient is also informed as to how he may obtain additional dietary counseling.

The food lists are given in detail at the end of each booklet. The foods which may be used and those which must be avoided are listed in parallel columns for convenience, and the amount of food making up a unit is explained.

Distribution of Booklets and Exhibits

Distribution of the booklets will be handled through state and local heart associations, with single copies available to the patient on request of his physician. Dietitians and physicians who wish to have a supply of booklets in their clinics or offices for distribution to patients can purchase them from their heart associations. Each heart association has its own policy regarding the distribution of reference copies to professional persons. A limited number of reference copies are available from state health departments or from the Heart Disease Control Program of the Public Health Service.

An exhibit has been designed to introduce the booklets to physicians and other professions and to point out hidden sources of sodium, other than food, that could counteract the prescription. There are four copies of this exhibit—a large model 8 by 8 by 4 ft. (shipping weight 450 lb.), and three table-top models 2 by 4 by 4 ft. 4 in. (shipping weight 70 lb.). Professional groups are offered the use of the exhibit free of charge. Further information on the loan of the *table-top* exhibit may be obtained from state and local heart associations or from the Heart Disease Control Program of the Public Health Service. Inquiries about the *large* exhibit should be sent to the Heart Disease Control Program, Public Health Service, Washington 25, D. C.

[2]The American Heart Association plans to publish a cook book at a later date.

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Sanitation: Suggestions for Reading[1]

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IN A RECENT issue of *Time* magazine, a surgeon made some bitter complaints about the general insanitation of hospitals (1). We know, too, that outbreaks of food poisoning originating in school lunch facilities still occur. However, there has been a growing effort in many of the states to promote the

[1]Presented at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 24, 1957.

education of persons responsible for food service in schools (2). I know that those of you engaged in public health nutrition and in private institutional dietetics have been applying your efforts to improve the levels of sanitation. Nevertheless, I was somewhat dismayed, on reading a fairly recent article on the subject of improving food service in small hospitals (3), to find that not a single comment was made on sanitation. The closest approach was a statement that menus must necessarily be made up in advance in order to help control the buying of supplies and the daily ordering of perishables. I had hoped that an article on a topic as general as this would at least mention the importance of sanitation.

Elements of Good Sanitation

Sanitation might be defined as the application of scientific and technical knowledge and skills to obtain a healthful environment. It will probably be more useful to the dietitian to consider sanitation in terms of the various phases of good sanitation.

Good housekeeping is basic. Probably each of us would come up with a different definition of good housekeeping as it applies to any given area, but for most of us it surely conjures pictures of order, accessibility, and general cleanliness.

The cleaning and sanitizing of food preparation and food service equipment are so important that this subject alone must receive extensive and careful study. Here is the place for discussion of dishwashing, which is an item of importance not only in the maintenance of healthful conditions but also in relation to the budget.

Under the heading of storage, we might discuss the sanitary storage of properly cleaned and sanitized utensils; the refrigeration or storage of food products prior to preparation; the hot and cold storage of prepared foods prior to, during, and after service; the storage of reusable leftovers; the storage of garbage; and the storage of miscellaneous items to prevent their interference with the general sanitation program.

It has been said that the factor most likely to introduce contamination into foods or food products is the human factor. Thus, the development among all personnel of adequate discipline in sanitation is essential.

Structural Design and Equipment

Hospital or institutional structures once built are expected to last many years, but it is all too infrequent that the opportunity arises for the preliminary consideration of structural design in the light of the sanitary sciences. The problems of sanitation are frequently overlooked to a significant degree in new construction. Whether the facilities are old or new, there are always problems of maintenance, and therein sanitation should receive adequate attention.

Lighting and ventilation play a fairly obvious part in good sanitation. No worker can be expected to do an adequate cleaning job in an area where the surfaces to be cleaned cannot be properly seen. By the same token, the supervisor has difficulty inspecting poorly lighted equipment or areas. This creates an opportunity for the worker who may be inclined to stint on his efforts. Ventilation is important to the comfort of persons working in an area and to the protection of foods from possible absorption of foreign odors. Study should be given to the proper installation and maintenance of any necessary hoods, vent fans, or similar devices. Window screens, fly protective fans, and numerous other items may need consideration.

Closely related to structural design and maintenance is the subject of equipment selection and installation. Fortunately, much progress has been made on the development of adequate sanitation standards in the design and construction of food preparation and food service equipment. Among such standards are those of the National Sanitation Foundation (6) and of the Baking Industry Sanitation Standards Committee (7). It is strongly recommended that, where standards do exist for a given type of equipment, only equipment which meets such standards be purchased. However, the best of equipment can be installed in such fashion as to interfere with proper sanitation maintenance. Here, again, is an area where the architect and the engineer should receive the benefit of adequate sanitation advice.

Regardless of the best directed efforts to "build out" and keep out pests of various types, some will inevitably find access to the areas where foods are stored, prepared, or served. It then becomes necessary for persons qualified by the appropriate knowledge to develop a program for ridding the premises of these pests. It is important that a preventive pest control program be established in every institution so that the possibilities for trouble may be foreseen and forestalled, and so that corrective measures may be taken immediately when trouble does develop.

Sanitation Inspection

The capstone for any complete sanitation program is adequate provision for sanitation inspection (8). Unless a definite self-inspection program is established, it is a foregone conclusion that sanitation deficiencies will develop and may become serious before they are detected. We have found that one of the most satisfactory approaches to the self-inspection program is through the establishment of a sanitation committee. The principle of improving the results from any organizational effort through

increasing the number of people interested and feeling a responsibility is too well recognized to require discussion.

Sometimes the sanitation committee is responsible for both sanitation and safety; sometimes it functions on sanitation alone. In either case, it is desirable to have representatives from the various staff and operative units of the organization included on the committee. This may mean that the committee will consist of ten or more people.

To prevent unwieldliness in the performance of self-inspections, it is desirable that a small group of perhaps three or four persons be selected to constitute a detail for each individual inspection. The duty can rotate among the members of the larger group. Someone professionally qualified to do so should develop a check list or guide to be used by the inspection committee. The committee of the whole can function effectively in the review of sanitation standards and the assessment of sanitation achievements as reflected by the reports of the inspecting committees.

Staff Cooperation

Mutual assistance among staff members is important in the achievement of a good and efficient sanitation program. This fact has already been made self-evident in the preceding discussion. Because of her technical knowledge of foods, their composition, and their susceptibility to the action of microorganisms, the dietitian can play an important role in assisting the administrator and the technical and operating staff of any institution.

Sometimes the opportunity is overlooked to make a direct contribution to the economy of the operation through cooperation and coordination with the purchasing agent. The dietitian will almost certainly have responsibility for cleaning tasks performed by some of the personnel. She will have an opportunity to help select the methods, equipment, and supplies used. In an article on purchasing sanitation supplies, Casey has outlined very intelligently the ways in which personnel having sanitation responsibility can assist the purchasing agent (9). At the same time, he has stressed the responsibility of the purchasing agent to help conserve the time of those responsible for sanitation through protecting them from excessive interruptions by salesmen and through having immediately available the knowledge of where needed items may be obtained.

Sanitation Personnel

One of the basic purposes of a good sanitation program should be to promote pride and productivity among sanitation personnel, for these will have important effects on costs and results. Even today, sanitation is too commonly thought of in terms of janitorial tasks. On that basis, it is easy to understand why intelligent and competent workers tend to shun employment in the sanitation group on the assumption that the work is dull and demeaning. This unfortunate attitude is basically the fault of management and administration.

A function including as many complexities as sanitation maintenance manifestly requires proper supervision. In our experience as sanitation consultants, we find a wide variety of organizational structures for handling the function of sanitation. Too often supervision is delegated to someone whose other duties are so demanding or so much closer to his own interests that the sanitation responsibilities suffer. Regardless of the exact structure of your own particular organization, you with a direct interest in sanitation will find it beneficial to lend your full support to the person having immediate responsibility.

Good sanitation can result only when managerial support (10) and adequate supervision are provided and when a definite program of personnel training and development of sanitation methods exists. Hunter, President of the American Institute of Baking, made the following statement (11): "It has too often been taken for granted that employees improve with experience. Management has frequently lost sight of the fact that experience, *per se*, teaches the bad with the good. It is 'guided' experience—that is, education—that assures personnel development." These elements of guidance can guarantee the success of the sanitation program and favorably affect program costs.

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More on Sanitation

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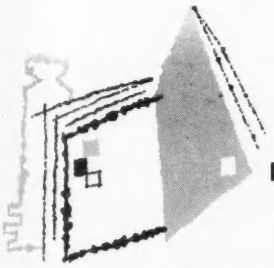

BOOK REVIEWS

Human Protein Requirements and Their Fulfilment in Practice. Proceedings of a Conference in Princeton, United States (1955). Sponsored jointly by the Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), Josiah Macy Jr. Foundation, New York. Edited by J. C. Waterlow and Joan M. L. Stephen. Briston, England: John Wright & Sons Ltd., at the Stonebridge Press; U.S. distributor, International Documents Service Columbia University Press, New York 27, 1957. Paper. Pp. 193. Price $2.

The Princeton Conference reported in this volume was the second held on proteins in nutrition and sponsored jointly by FAO, WHO, and the Josiah Macy Jr. Foundation. The first was held in Jamaica in 1953 and dealt primarily with the biochemical, pathologic, and clinical aspects of protein malnutrition. The Princeton Conference was convened two years later to consider (a) the experimental work on man and animals, (b) human protein requirements at different ages, and (c) practical measures to increase protein intakes.

The edited report takes the form of a verbatim discussion of each topic by the many expert participants. Fundamental data are presented in table and chart form, but much additional valuable information is found in the discussions. At the end of each section there is a summary and list of references. The section on practical measures to increase protein intakes enumerates the many problems associated with the development and testing, with the protection during distribution and storage, and with the acceptance of products which are sources of additional protein.

The entire report would be excellent reference material for graduate students. Studying it is likely to broaden measurably the researcher's and student's concept of the problems of protein nutrition throughout the world as well as increasing their knowledge.—*Ruth M. Leverton, Ph.D., Institute of Home Economics, U.S. Department of Agriculture, Washington, D.C.*

Practical Nutrition. By Alice B. Peyton. Philadelphia: J. B. Lippincott Company, 1957. Cloth. Pp. 379 plus supplement, pp. 1-32. Price $3.60.

This book is written in a clear, easy-to-understand manner and covers a great deal of practical information. The material is grouped under four main sections: "Normal Nutrition," "Diet Therapy," "Food Economics," and an appendix giving specific food plans at low and moderate cost and food composition tables. In the preface, the author states that the book was planned and developed with the needs of the practical nursing student in mind, and to serve as an authoritative source of information for the homemaker and the individual who wishes to develop better food habits and promote better health.

The normal nutrition section devotes a chapter to each of the food nutrients and covers such subjects as: meal planning for the family, infant feeding, food needs of the older age group, food fads and fallacies, and safeguarding the food supply.

The "Diet Therapy" section is quite complete in discussion of the general types of conditions requiring dietary alteration although each type is treated in a brief and non-technical manner. Standard hospital diets and recipes for modified diets are included. Other chapter headings are: Overweight and Underweight, Fevers, Disorders of the Gastro-Intestinal Tract, Disorders of the Liver and the Gallbladder, Diabetes, Cardiovascular Diseases, Arthritis, Allergies and Skin Disturbances, and Malignant Tumors.

Regimens for dietary modification are taken from *Handbook of Diet Therapy.* Diabetic treatment is based on the diabetes exchange system. Recipes for allergy and low-sodium menu items are given with reference to other recipe sources and guides.

The "Food Economics" section gives detailed menus and information on meal planning and food budgeting. Separate chapters are devoted to the various food groups. Food in relation to the family budget and planning at different income levels are also discussed.

The appendix includes the Recommended Dietary Allowances, a food composition table for the short method of dietary analysis, and caloric values of average servings of commonly used foods. The standard measures, weights, and abbreviations are given as well as a particularly helpful reference section on other books, bulletins, reprints, and journals.

One feature of this book which makes it an excellent teaching guide is a blue section at the end giving supplementary readings for each section of the book as well as lists of problems and questions for classroom use.

One has the impression of having covered a great deal of territory in a general manner after reading the book. The chapters are short, the style of writing is clear and easy to read. The book should prove to be valuable for its stated purpose—that of providing simple and practical nutrition information.—*Esther Winterfeldt, Department of Dietetics, University of Chicago Clinics.*

A History of Nutrition. By Elmer Verne McCollum. Boston: Houghton Mifflin Company, 1957. Cloth. Pp. 451. Price $6.

There has long been the need for a standard work on the history of nutrition because only through knowledge of the past can we fully understand the present. Only in this twentieth century has nutrition been recognized as a separate science; the author of this book has grown up with this science and has devoted his life to the shaping of our present knowledge of nutrition. Dr. McCollum's many original research contributions, including the discovery of vitamin A and its separation from butter fat, are well known. Such close association with the development of nutrition and his long continued reading of the scientific literature in many languages make him eminently well qualified to write this history.

The sub-title, "The sequence of ideas in nutrition investigations," indicates the content of the book. The first chapter briefly sketches "Some Pre-Scientific Ideas about Food," or what was known about food and diet in early times. The other twenty-seven chapters deal with the growth of our scientific knowledge over the past two hundred years. The author traces the beginnings of the new trends in thought and the development of experimental inquiry in nutrition in chronological order for each nutrient.

The history of nutrition must draw on many related sciences in which it had its origins and covers a wide field. To compress the subject into one volume, the author has had to be selective. Not all scientists will agree with his selections (and there can be no final answer as to which were *the* key discoveries which influenced later investigators), but none can deny the value of the material presented by one who has a keen analytical mind, is a master of the subject, and has devoted ten years to continuous reading in the field prior to writing the book.

Each chapter is well documented and the indexes of names and of subjects make it a most practical reference. This book should be in the hands of every dietitian, nutritionist, physician, teacher, and all who appreciate science and its history.

One cannot help wishing that illustrations of some of the early experiments, laboratories, and investigators might have been included.—*E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

Heights and Weights of Children and Youth in the United States. By Milicent L. Hathaway. Home Economics Research Report No. 2, Institute of Home Economics, Agricultural Research Service, U.S. Department of Agriculture. Washington, D.C.: Government Printing Office, 1957. Paper. Pp. 131. Price 65 cents.

This handbook is divided into four sections. Section I presents data on height and weight measurements of white boys and girls, ages two to eighteen years, chiefly during the period from 1920 to 1956. Tables are presented for each age group. Each table is classified by region, state, and date of study and is supplemented with two "standards" for comparison, with the average values presented from the various studies.

Section II, which presents selected height-weight data "standards," includes Hastings tables (1902), Baldwin-Wood tables (1923, '25), Bayer-Gray charts (1935), Wetzel grid (1941), Jackson-Kelly charts (1943), Stuart-Meredith tables (1946), tables from NEA-AMA data (1949), and Boyd tables (1952). Of particular interest in this section are four graphs which compare: (a) average height for age for boys from data of Hastings, Baldwin-Wood, Stuart-Meredith, and Boyd; (b) average height for age for girls; (c) average weight for age for boys; and (d) average weight for age for girls, all from these same standards.

Some factors affecting growth patterns are presented in Section III. Included are tables and graphs showing Richey's data (1937) relating size to age at pubescence; Shuttleworth's data (1939) relating size to age of maximum growth date; and Bayley's data (1956) on size and rate of physical maturation. In this section are also gathered height-weight data related to nationality and socio-economic status. Graphs show Meredith's data (Boston) and Matheny and Meredith's data (Hibbing, Minnesota) relating heights of boys and girls to nationality.

Of interest in this section also are height-weight-age data related to decade of measurement. Comparison of heights and weights of boys and girls, ages five to eighteen years, in two periods about fifty years apart (Boston and vicinity) shows that average gains were similar, but that both boys and girls were taller and heavier in the 1920's than in the 1870's. Graphs are also included for difference in height over a fifty-year span of six- to fourteen-year-old children in Toronto; also heights of infants in the U.S. over a ninety-year span. Height-weight-age data related to geographic location are presented in three graphs showing: (a) heights and weights of boys and girls in Canada and the U.S., (b) longitudinal data representing two decades for heights of boys and girls from four areas, and (c) weights of boys and girls from four areas.

Section IV is an annotated list of 275 literature references. This includes not only the references to the studies covered in the text, but additional studies of other measurements not discussed. This handbook should prove a valuable tool to research nutritionists and all interested in growth, physical condition, and health of children.—*Frieda L. Meyer, Ph.D., Director, Research Laboratory of Human Nutrition, University of Alabama, Tuscaloosa.*

The Peasant Cookbook. By Marian Tracy; Garden City, N.Y.: Hanover House, 1955. Cloth. Pp 224. Price $3.50.

The Peasant Cookbook is superb; it would be my second cookbook if I could own only two. My first choice would be *Practical Cookery*, that long-time standard from Kansas State College, for it covers all basic cookery principles with variations suitable for all parts of the United States.

"Foreign" cooking has, however, become of tremendous interest in the United States. Every book store is full of French, German, and Italian cookbooks. The more adventurous cooks have shelves of them, filled with exotic recipes—expensive and complicated. Mrs. Tracy, I presume, reasoned that the "favorite foods" of any land are those that are familiar, beloved, and served often. They must, then, be relatively simple and not too expensive. From friends, books, and travel she gathered these recipes and put them into typical menus. Here are the traditional dishes of thirty-nine countries, using ingredients we can obtain and procedures with which we are familiar.

My review copy is spattered and worn. My sons think her pizza is as good as mine and my husband thinks her Italian meat balls better! The Swiss fondue sent us into gales of laughter as we pushed our bits of French bread around the chafing dish. The Roumanian cucumber salad improves with age and is fine for patio suppers. We had meat balls Swedish, Danish, Persian, Roumanian, and the marvelous Italian ones. Gazpacho and borscht are cold soups, wonderful for Houston summers (a season lasting about nine months!). There are more recipes from the Near East and the Far East than I have seen in a "world" cookbook.

There is no reason why many of these recipes could not be increased to sizes suitable for cafeterias and dining rooms. For many new ideas and combinations, *The Peasant Cookbook* could be most useful. These are the foods of hundreds and thousands of persons of every color and nation, and their popularity is based on wide appeal.

Without any hesitation, I would say that every reader of this column would enjoy owning a copy of *The Peasant Cookbook.*—*Virginia Monahan Bayles, Houston.*

RECENT BOOKS RECEIVED

Manual of Nutrition. Fourth edition. By Scientific Adviser's Division (Food), Ministry of Agriculture, Fisheries and Food, Great Britain. New York: Philosophical Library, Inc., 1957. Pp. 70. Price $3.50.

Nutrition and Diet Therapy in Relation to Nursing. Second edition. By Marie V. Krause. Philadelphia: W. B. Saunders Co., 1957. Cloth. Pp. 621. Price $6.

Betty Crocker's Cook Book for Boys and Girls. New York: Simon and Schuster 1957. Paper, spiral bound. Pp. 191. Price $1.

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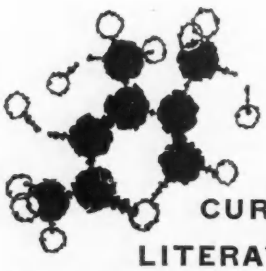

CURRENT LITERATURE

Contributed by Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore; Clara Karl, University of Chicago Clinics; Elizabeth Tuft, Chicago Wesley Memorial Hospital; Ruth Marie Valentine, Dietetic Intern, VA Center, Los Angeles; and the Journal staff

ACTA SOCIETATIS MEDICORUM UPSALIENSIS

Vol. 62, No. 3-4, 1957

*The change in total nitrogen and electrophoretic pattern in human colostrum during the first days of lactation. F. Nordbring.—p. 113.

Total Nitrogen in Human Colostrum. The total nitrogen was determined in a series of daily colostrum samples from twenty women. A steep fall in nitrogen content was shown during the first three days after delivery. A marked reduction of globulins of slow mobility was shown, occurring during the same time as the total nitrogen decreased. The decrease in the globulins coincided with the decrease in antibody titre.

AMERICAN JOURNAL OF MEDICINE

Vol. 23, December, 1957

*The effects of corn oil on serum lipids in normal active subjects. W. Shapiro, E. H. Estes, Jr., and H. L. Hilderman.—p. 898.

Nutritional factors and serum lipid levels. E. H. Ahrens.—p. 928.

Corn Oil and Serum Lipids. The serum lipids of six normal young men on diets of varying fat composition were studied. When 70 per cent of fat intake was made up of corn oil emulsion and the total fat restricted to 100 gm. per day, impressive depressions of all serum lipid fractions were recorded. The mean control serum cholesterol level of 222 mg. per 100 ml. fell to 158 mg. for two weeks. When the total fat intake was increased to 170 gm. per day, the serum cholesterol rose toward the initial levels, despite continued daily ingestion of 70 gm. corn oil. All fractions tested, except beta lipoproteins and iodine numbers, tended to return toward control values when calories and total fat intake were increased and the percentage of total fat made up by corn oil decreased 41 per cent.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 47, November, 1957

*Role of dietary fat in human nutrition. I—Role of unsaturated dietary fat in infant nutrition. A. E. Hansen.—p. 1367.

*Role of dietary fat in human nutrition. II—Role of unsaturated fat in adult nutrition. J. M. R. Beveridge.—p. 1370.

Vol. 47, December, 1957

*Role of dietary fat in human nutrition. III—Diet and the epidemiology of coronary heart disease. A. Keys and F. Grande.—p. 1520.

*Role of dietary fat in human nutrition. IV—Experimental and clinical evidence relating to the effect of dietary fat upon health in man. T. B. Van Itallie.—p. 1530.

*Role of dietary fat in human nutrition. V.—Summary. R. E. Olson.—P. 1537.

Unsaturated Fats in Infants. It appears that certain fatty acids are essential in infant nutrition. Hansen found that infants with chronic eczema tended to have iodine numbers of the serum fatty acids in a lower range than infants with no eczema. Contrary to the accepted procedure of removing fat from the diet, fat supplements, such as fresh lard, raw linseed oil, and corn oil, were given. The essential fatty acids, particularly linoleic acid, were effective clinically in treating eczema. The slow acceptance of the discovery of the essential nature of dietary fat has been due in part, at least, to the relatively small amount of specific fatty acids required to prevent evidence of fat deficiency. Hansen has studied both the clinical and chemical changes in infants fed different milk mixtures varying in fat and linoleic acid content such as those in the milk preparations used in everyday infant feeding. Perhaps it is no accident that breast milk contains some three to four times more linoleic acid than the usual cow's milk mixtures used in infant feeding. Arteriosclerosis is not a problem in childhood, but one may conjecture that an adequate dietary intake of linoleic acid may have influences which do not become of significance until years later.

Unsaturated Fats in Adults. There is no doubt that lipids, in the form of triglycerides, plant and animal sterols, and substances associated with them, have a significant effect on the nutrition and well-being of the human being. The various effects of the so-called essential fatty acids, degree of unsaturation, and chain length have still to be determined adequately. There is a possibility that there may be other dietary factors that have as great an effect on plasma lipid levels as does fat. In this paper the author reviews the knowledge of the role of dietary fat in adult nutrition delineating what is known, as well as the problems that still require adequate investigation. Special emphasis is given to the unsaturated fatty acids.

Diet and Coronary Heart Disease. This paper by Keys and co-workers presents data supporting an association between the incidence of coronary artery disease, a high intake of total dietary fat, and the elevation of serum cholesterol. Epidemiologic study of various populations in different parts of the world indicate that diet is the difference. It seems probable that the more common fats of the American diet, when eaten in large amounts as is often the case in the U.S., may contribute to the production of relative hypercholesterolemia and so to atherogenesis. There is suggestive evidence that fatty meals may induce hypercoagulability of the blood and inhibition of fibrinolysis. Extensive research of the role of dietary fat is warranted.

Effect of Dietary Fat. Van Itallie suggests that hypercholesteremia may result from a chronic deficiency of essential fatty acids. It is stressed that the reciprocal roles of saturated and unsaturated fats in metabolism must be more specifically delineated. The hypothesis that the hypercholesteremia of adult males in northern Europe and North America is due to a chronic relative deficiency of essential fatty acids has certain attractive features; yet, the experimental evidence currently available only partly supports such a concept. Moreover, retrospective calculations based on food availability figures suggest that only a slight relative decrease in consumption of essential fatty acids may have occurred in the U.S. during the last fifty years.

Dietary Fats. This article is a summary of the salient contributions presented in preceding papers of this series on dietary fat. It is generally agreed that this is an extremely complex problem which will not have any simple answer. Olson emphasizes that this is a time for restraint and research, rather than a time for crash programs to modify the diet.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE (India)

Vol. 17, No. 4, 1957

*Gastro-enteritis in different age-groups and its association with certain serological types of *Escherichia coli*. A. Banerjea, D. N. Chatterji, and K. Pramanick.—p. 99.

Gastroenteritis in Different Age Groups. The pathogenic role of certain serotypes of *E. coli* in the production of infantile diarrhea has been widely accepted. The occurrence in adults of acute gastroenteritis resembling cholera, but showing mainly *E. coli* in the stool, started this investigation into the causes of gastroenteritis of all age-groups instead of infants only. Specimens of stool from seventy-three infants, children, and adults were examined. *E. coli* type 026 were found in a good number of both infants and adults. Five other types were also detected.

ARCHIVES OF INTERNAL MEDICINE

Vol. 100, October, 1957

The history of the use of iodine in toxic diffuse goiter (Graves' disease). A. L. Bloomfield.—p. 678.

Vol. 100, November, 1957

*Cholesteremia and nicotinic acid. P. O.

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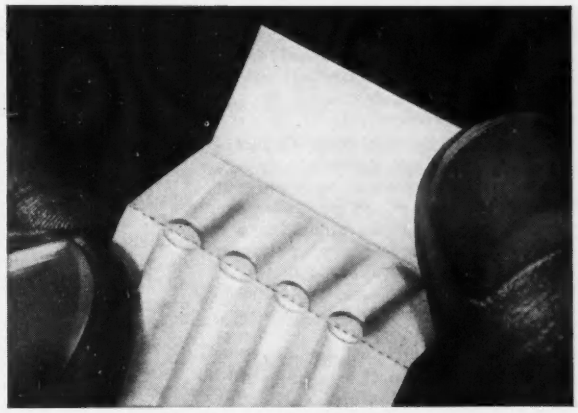

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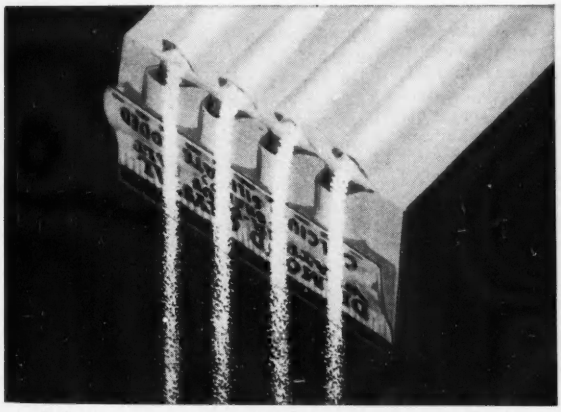

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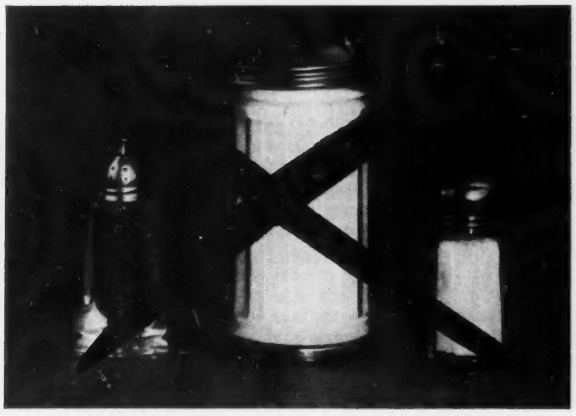

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O'Reilly, M. Demay, and K. Kotlowski.—p. 797.

Vol. 100, December, 1957

The high-pork diet of the Negro of the Southern United States. Editorial. G. E. Burch, J. H. Phillips, Jr., and W. Wood.—p. 859.

*The search for an experimental counterpart of pernicious anemia. M. M. Wintrobe.—p. 862.

Cholesteremia and Nicotinic Acid. A study of forty-seven patients in a mental hospital appears to confirm two facts: (a) that nicotinic acid does lower the serum cholesterol level, and (b) that its lowering action appears to be proportional to the level of blood cholesterol.

Search for Experimental Counterpart of Pernicious Anemia. Among the substances known to be important in the production of red corpuscles are protein, iron, copper, pyridoxine, folic acid, and cyanocobalamin (vitamin B_{12}). In experimental deficiencies in swine, pyridoxine and pantothenic acid have been shown to be necessary to maintain the integrity of the nervous system. Spinal cord degeneration has not been produced experimentally by a deficiency of vitamin B_{12}, but experience with pernicious anemia indicates that this vitamin is important in maintaining the integrity of the nervous system.

ARCHIVES OF PEDIATRICS

Vol. 74, October, 1957

*Studies on normal serum alkaline phosphatase in Egyptian infants and children. S. Awwaad and E. A. Eisa.—p. 370.

Serum Alkaline Phosphatase in Children. It has long been known that the serum alkaline phosphatase level is higher in children than in adults. Normal levels are of importance as a basis for studying variations in disease, especially as in recent years the significance and interpretation of phosphatase levels in various bony diseases, endocrine disturbances, and hepatic affections is rather rapidly increasing. The effect of sex, age, height, and weight on the phosphatase content was observed in normal Egyptian newborns, infants, and children. In the ages studied, there was no variation with regard to sex. At a given age, the normal variations of height and weight did not affect the levels. From the average levels found at different age periods, a composite curve was made. It is a double-rise curve; the first rise is a marked one and occurs in the first two years of life. The second rise is less marked and occurs between ten and fourteen years. The rises parallel the activity and rate of growth during the same age. In general, the figures for Egyptians in the ages studied are slightly lower than those mentioned for similar ages elsewhere. This may be due to variations in climatic, dietetic, and racial conditions.

THE BRITISH JOURNAL OF NUTRITION

Vol. 11, No. 4, 1957

*Food intakes, energy expenditures and faecal excretions of men on a polar expedition. J. P. Masterton, H. E. Lewis, and E. M. Widdowson.—p. 346.

*The effect of a supplementary multipurpose food on the growth and nutritional status of schoolchildren. V. Subrahmanyan, K. Joseph, T. R. Doraiswamy, M. Narayanarao, A. N. Sankaran, and M. Swaminathan.—p. 382.

*The metabolism of nitrogen, calcium and phosphorus in undernourished children. 3. The effect of a supplementary multipurpose food on the metabolism of nitrogen, calcium and phosphorus. K. Joseph, M. Narayanarao, M. Swaminathan, and V. Subrahmanyan.—p. 388.

*The content of amino-acids in white flour and bread. E. E. McDermott and J. Pace.—p. 446.

Energy Intake and Output of Polar Explorers. Dietary intakes and energy expenditures were made on four polar explorers both at the base camp and during a sledging expedition. At base camp the intake was 3000 to 4000 calories per day; while sledging, about 4800 calories. Energy expenditures were greater than the intakes when the subjects were sledging. Feces were analyzed, and the per cent of fat was within normal limits. Nitrogen in the feces was normal. The present results offer no physiologic reason why husky dogs eat human feces in preference to other food.

Multipurpose Food in Children's Diets. A feeding experiment extending over a five-month period was carried out on school girls ages four to twelve years in India to assess the value of supplementing their poor vegetarian diet with 2 oz. daily of a multipurpose food. This food was composed of peanut flour and Bengal-gram flour and was fortified with certain vitamins and calcium phosphate. There was a significant increase in height, weight, red-cell count, and hemoglobin levels of the subjects receiving the supplement.

Metabolism of Undernourished Children. The metabolism of nitrogen, calcium, and phosphorus was studied in girls fed on an inadequate poor vegetarian diet based on rice and on the same diet supplemented daily with a multipurpose food composed of peanut flour and Bengal-gram flour fortified with vitamins and calcium phosphate. The mean daily intakes of nitrogen, calcium, and phosphorus are given for both groups. All of the girls maintained positive balances for each element. However, there was a significantly higher retention of each element in the group on the supplemented diet.

Amino Acids in Flour and Bread. The content of amino acids in hydrolysates of white flour, of bread made from that flour, and of the crust of the bread has been determined by ion-exchange chromatography. The contents of phenylalanine, tyrosine, and serine were lower in the bread than in the flour. More pronounced losses were observed in the crust—notably phenylalanine, tyrosine, and lysine—than in the flour. It is difficult to determine how much loss is due to baking and how much during hydrolysis. The approximate quantity of the essential amino acids provided by the average daily consumption of flour and bread is presented.

BRITISH MEDICAL JOURNAL

No. 5052, November 2, 1957

*Some effects of adrenal cortical steroids on intermediary metabolism G. W. Thorn, A. E. Renold, and A. I. Winegrad.—p. 1009.

No. 5054, November 16, 1957

*Some pediatric problems of Uganda. J. Luder.—p. 1143.

No. 5057, December 7, 1957

*Oral treatment of diabetes with tolbutamide. I. Singh.—p. 1345.

Adrenal Cortex and Metabolism. The adrenal cortex influences markedly the metabolism of carbohydrate, protein, and fat in the mammal. The effects of adrenal cortical steroids on intermediary metabolism have been studied in isolated tissues, in intact experimental animals, and in man. In man, these studies have included observations following administration of exogenous steroids as well as the analysis of the syndrome resulting from excess or absence of endogenous gluco-corticoids—that is, Cushing's syndrome and Addison's disease. Increased hepatic gluconeogenesis is the most readily demonstrated metabolic effect of these steroids and has been established in isolated liver as well as in the intact animal and human organism. The time lapse between the administration of the hormones and the first appearance of evidence suggesting increased gluconeogenesis is approximately 1 to 3 hr. In experimental animals, corticosteroids also inhibit the synthesis of long-chain fatty acids by liver and to a lesser degree by adipose tissue. In addition, a direct effect on the catabolism of body protein can be demonstrated in the liverless organism. The occurrence of marked protein depletion in patients with Cushing's syndrome at a time when glucose tolerance is still normal or affected only to a minor degree suggests that the latter effect is independent of the effect on hepatic gluconeogenesis and that it may be closer to the primary site of corticosteroid action. Although our understanding of the effect of adrenal cortical steroids on intermediary metabolism has been improved, we are as yet unable to assign discrete metabolic sites to any of these effects, let alone suggest a primary site of corticosteroid action which could account for all their known metabolic effects.

Pediatric Problems of Uganda. Uganda is a somewhat under populated country taken as a whole, supporting some five million people. With a good average rainfall and mainly fertile soil, it could undoubtedly support far more. The effects of disease and deprivation, however, have kept the population static, and until recently it was declining, owing to the

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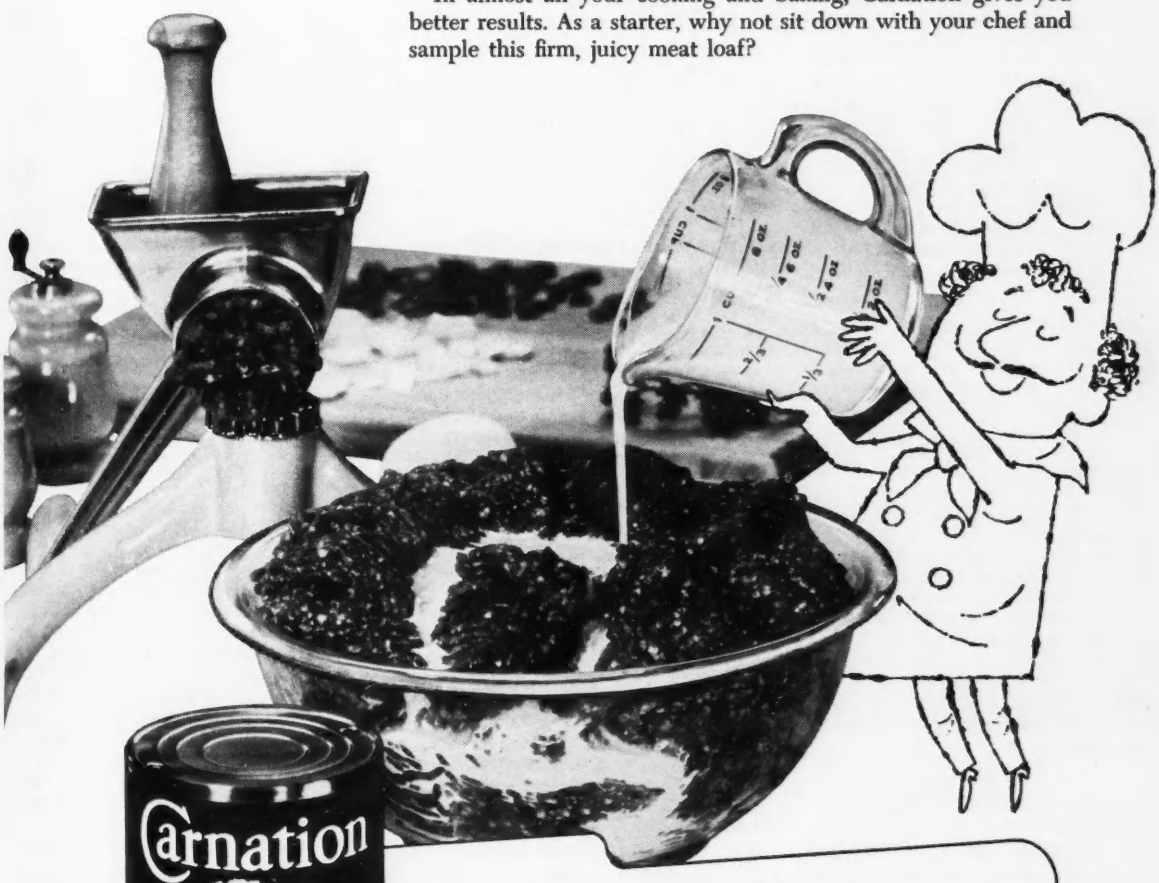

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- 1 tablespoon Worcestershire Sauce
- 1 cup finely chopped onion
- ½ cup finely chopped green pepper

Blend all ingredients together until smooth. Place in two loaf pans (8"x 4"x 2"). Bake in moderate oven (350°F.) for about 1 hour.

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combined effects of relative infertility and premature adult death. Infant mortality is very high and there is a high death rate throughout childhood, the main causes being malnutrition, malaria, respiratory disease, gastroenteritis, helminthiasis, and sickle-cell anemia. Medical work is hampered largely by financial stringency and to a less extent by superstition and suspicion on the part of patients. In most tropical regions, breast-feeding is the only available method of rearing infants, and in the vast majority of cases it is successful. It is well known that breast-feeding may be continued for long periods—for example, two years or more—unless interrupted by another pregnancy. The further from civilization, the longer is the period, as a rule. Three main types of malnutrition can be distinguished although there is, of course, considerable overlap. These are: marasmus, kwashiorkor, and vitamin deficiencies. The conception of a tropical branch of pediatrics is justified by the different pattern of child life and disease, and the subject has received little prominence in medical teaching, considering the huge child populations of the tropics and subtropics.

Oral Treatment of Diabetes with Tolbutamide. One hundred thirty-six cases of "adult-onset" diabetes mellitus were treated with tolbutamide. The results were very satisfactory in 94 cases (68 per cent), satisfactory in 32 (23 per cent), and failures in 11 (9 per cent). The result was also satisfactory in one case of congenital diabetes in a child of four years. No serious side-reactions were encountered. The patients were given a high-carbohydrate (250 to 300 gm.), low-fat (20 to 50 gm.) diet adjusted to individual needs. Since most of the patients were well versed in the routine management of their disease, ambulatory treatment was possible. This procedure did not involve any risk. The factors influencing the action of the drug and its use are discussed.

CANADIAN PUBLIC HEALTH JOURNAL

Vol. 48, November, 1957

*Evaluation of dental caries preventive measures applicable to the community level. G. Nikiforuk.—p. 464.

Dental Caries Prevention. The ten-year reports of controlled fluoridation of communal water supplies in Grand Rapids, Brantford, and Newburgh indicate a marked reduction in the prevalence of dental caries in primary and permanent teeth of residents ingesting fluoridated water since birth. Beneficial posteruptive effects of fluoridated water were noted on permanent teeth. The ten-year medical studies indicate no significant medical difference between the group that consumed water which contained 8 p.p.m. fluoride compared with a group drinking water containing insignificant amounts of fluoride. In Canada, approximately one million persons are benefiting from communal water fluoridation programs. The clinical evidence that fluorides in a dentifrice significantly reduce dental caries is inconclusive. Topical application of sodium and stannous fluoride to teeth significantly reduces dental caries in children.

FOOD RESEARCH

Vol. 22, November-December, 1957

*Use of high-voltage cathode rays to destroy bacteria of the *Salmonella* group in whole egg solids, egg yolk solids, and frozen egg yolk. R. C. Brogle, J. T. R. Nickerson, B. E. Proctor, A. Pyne, C. Campbell, S. Charm, and H. Lineweaver.—p. 572.

*Notes on some Southern Rhodesian indigenous fruits, with particular reference to their ascorbic acid content. W. R. Carr.—p. 590.

*Effect of four conditions of cooking on the eating quality of two cuts of beef. S. Cover, J. A. Bannister, and E. Kehlenbrink.—p. 635.

*The microbiology of fresh and irradiated beef. E. F. Wolin, J. B. Evans, and C. F. Niven, Jr.—p. 682.

*Effect of carbonated beverages on bacteria. Notes and Letters. R. G. Eagon and C. R. Green.—p. 687.

High-Voltage Cathode Rays Destroy Salmonella. This investigation is concerned with the determinations of the doses of high-voltage cathode rays necessary to destroy *Salmonella* in whole egg solids, egg yolk solids, and in frozen egg yolk. The effect of these rays on the flavor and functional quantities of these products was noted. Possible means of alleviating irradiation-induced off flavors are also reported.

Ascorbic Acids in Fruits. A description of some indigenous fruit trees and shrubs of Southern Rhodesia is given. The ascorbic acid content, weight, edible portion, moisture, and sugar content of the fruit is presented.

Cooking of Beef. Two cuts of beef, loin steak and bottom round steak, were cooked to two degrees of doneness by broiling (internal temperatures 61°C. and 80°C.) and by braising (internal temperatures 85°C and 100°C. plus a holding period of 25 min.) The meats were tested for tenderness of connective tissue and of muscle fibers. Juiceness scores were also obtained. Results are given. Tenderness in meat has more than one component; loin and bottom round steaks differ markedly in tenderness with respect to cooking conditions.

Microbiology of Beef. Because of the rapid spoilage of fresh beef under normal conditions, satisfactory methods of preservation are sorely needed. High-energy ionizing radiations are promising, but dosages required for complete sterilization produce undesirable odors and flavors. The initial phase of this investigation consists of a survey of the bacteria responsible for beef spoilage. This apparently is due to *Pseudomonas geniculata* and related pseudomonads, which are very sensitive to gamma radiation. Radiation dosages are given for pure bacterial cultures and for inoculated packaged meat samples. Irradiated beef eventually spoils bacteriologically due to the slow growth of a radiation-resistant group of organisms, apparently identical to *Microbacterium thermosphactum*.

Carbonated Beverages and Bacteria. Carbonated beverages are a highly unfavorable environment for bacteria. Experimental data presented in this paper indicate that the killing effect is derived mainly from the low *p*H involved, and that carbonation increased the efficiency of killing only slightly.

FOOD TECHNOLOGY

Vol. 11, December, 1957

*Palatability of chickens fed diets containing different levels of fish oil or tallow. I. Evaluation by a consumer-type panel. II. Evaluation by a trained panel. D. Carlson, L. M. Potter, L. D. Matterson, E. P. Singsen, G. L. Gilpin, R. A. Redstrom, and E. H. Dawson.—p. 615.

*Factors affecting quality of prepackaged meat. II. Color studies. C. Effects of air and oxygen under different pressures upon color of product. J. A. Rikert, L. Bressler, C. O. Ball, and E. F. Stier.—p. 625.

*Relative efficacy of three tetracyclines with poultry meat. F. E. Wells, J. L. Fry, W. W. Marion, and W. J. Stadelman.—p. 656.

Trihydroxybutyrophenone—a food grade antioxidant. B. N. Stuckey and W. M. Gearhart.—p. 676.

*The influence of sugar in ice cream. I. Consumer preferences for vanilla ice cream. R. M. Pangborn, M. Simone, and T. A. Nickerson.—p. 679.

Flavor of Chickens. It is known that the flesh of poultry is subject to off-flavors imparted by certain feed ingredients, notably fish oils. This study was conducted to establish the amounts of certain commonly used fats and fish oils that could be safely used without adverse effects on the flavor of broilers. It was also necessary to determine whether off-flavors due to fish oils could be eliminated by the presence of antioxidants in the broiler feed. A laboratory study found that chickens fed 1 or 2 per cent menhaden fish oil with or without the antioxidant DPPD (diphenyl-paraphenylene diamine) had significantly more off-flavor than the controls; those fed 0.5 per cent menhaden fish oil with or without DPPD in addition to the 0.5 per cent in the basal diet were not significantly different from control samples. Where 0.5, 1, or 2 per cent tallow was added to the diet, chickens had very slight or no observed off-flavor. The consumer study found that the addition of 1 or 2 per cent menhaden oil with or without DPPD added to the basal diet resulted in fishy off-flavors; the amount of off-flavor resulting from diets consisting of 0.5 per cent menhaden oil, without DPPD, was similar to that for the basal diets; and the addition of 0.5, 1, or 2 per cent tallow to the basal diet resulted in no objectional off-flavors.

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* * *

Kraft Red Label Shortening
Confectioners' sugar

Sift dry ingredients together; cut in shortening. Add milk and eggs to form soft dough. Roll dough thin; cut with 4-inch round cutter. Place a rounded tablespoon of filling on half of each round. Wet the edge; fold other half of dough over filling and press edges together with fork. Deep-fry in Kraft Red Label Shortening at 375° for 1¼ minutes. Drain; sprinkle with confectioners' sugar; serve hot.

Apple Filling—1 pint for 24 servings: Combine 1½ pints canned apples, drained, ½ cup sugar, ¼ teaspoon cinnamon. Simmer ½ hour, stirring occasionally; cool.

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Fresh Meat and Cured Ham. The effect of vacuum variations at constant temperatures was studied. Ground samples of fresh meat and of cured ham were stored in desiccators under different pressures of air while the temperature was maintained constant at 34°F. When fresh meat was stored under a vacuum of 20 in. or more, both the initial loss of redness and the return of redness were more rapid than in meat stored under a vacuum of less than 20 in. Both increasing the vacuum while maintaining a constant storage temperature and increasing the storage temperature while maintaining a constant vacuum increased the rate of initial darkening and shortened the time for the subsequent return of redness. Vacuum appears to be necessary for the return of redness, but not for the initial darkening. The change in color from grey to red, which occurred in samples stored under vacuum, is apparently reversible. A change can be produced toward either greyness or redness, depending on the absence or presence of high vacuum, respectively.

Tetracyclines for Poultry Meat. Three antibiotics—tetracycline, oxytetracycline, and chlortetracycline—were compared at four storage temperatures for their ability to extend the shelf life of poultry meat. Chickens were killed, scalded at 140°F. (60°C.) for 40 seconds, mechanically picked, eviscerated, and chilled. After chilling and prior to packaging, they were treated by immersion in a solution of 10 p.p.m. of the respective antibiotic for 15 min. Packaging was done by placing in a cardboard tray and then placing the tray in a polyethylene bag. Storage was accomplished by placing the packaged chickens in coolers held at 0°C., 3°C., 9°C., and 12°C. Spoilage was determined by observing for microbial growth, development of slime, and development of odor. Half birds were used—four halves for each treatment at each storage temperature. Three replications were made. In addition, one series was treated at a commercial processing plant to compare the results obtained there with the results from the University plant. Chlortetracycline was found to be the most effective at all temperature levels, although at the two higher temperatures, differences were small. Effectiveness of all antibiotics was greatest at the lower temperatures. Predominant types of microflora present at the time of spoilage were isolated. Types found on the untreated birds agreed with published findings. A number of the birds treated with the antibiotics were spoiled due to the growth of yeasts, especially at the lower temperature ranges.

Consumer Preference Testing of Ice Cream. Over 6000 consumers evaluated vanilla ice cream containing 11, 13, 15, 17, or 19 per cent sugar, by paired comparison-preference. Results showed the three higher levels were liked equally well but were preferred to a significant degree over the 11 and 13 per cent sugar levels. Neither environmental temperature nor body size seemed to influence sweetness preferences. Males showed more decided preferences as a group than females. The two age groups of sixteen to twenty-five and twenty-five to fifty years showed more discrimination than younger or older consumers. People who consumed ice cream several times a week had more decided preferences than those who ate it less frequently. By all methods of classification of the data, the sample containing 11 per cent sucrose was least often preferred.

GASTROENTEROLOGY

Vol. 33, October, 1957

*The fecal residue from a normal diet of known composition. E. K. Diao and F. A. Johnston.—p. 605.

Vol. 33, November, 1957

*The use of a fat emulsion as a source of calories in patients requiring intravenous alimentation. H. Krieger, W. E. Abbott, S. Levey, and W. D. Holden.—p. 807

*Study of some factors which influence the level of serum amylase in dogs and humans. T. W. Challis, L. C. Reid, and J. W. Hinton.—p. 818.

Fecal Residue Study. Studies of fecal residue were done on nine women for 112 days. Each subject consumed a weighed diet; the mean daily intake was 261 gm. carbohydrate, 70 gm. protein, 91 gm. fat, and 3.7 gm. fiber. The mean caloric intake was 2140. The same four-day meal plan was repeated twenty-eight times. The foods served were similar to those eaten by the average person in the U. S. The mean dry weight of feces was 20.9 gm. per day. The average expulsion time was 26¾ to 36½ hr. The longer the expulsion time, the lower was the dry weight of the feces. The menstrual period had an effect on the dry weight of the feces for seven of the nine subjects. It was felt that the increase in dry weight indicated increased intestinal motility which sweeps out more fecal material.

Fat Emulsion in Intravenous Alimentation. Parenteral feeding, until recently, has been unsatisfactory in meeting the caloric requirements of the patient. Alimentary canal obstruction and postoperative gastrectomy are examples of conditions where oral diet is impracticable. A new fat emulsion has been developed to satisfy the caloric requirement. This emulsion, with its high caloric value per unit, is the answer. Previously tried fat emulsions caused severe reactions in most patients. In the new product these undesirable reactions are negligible. The protein requirement can be met by the use of protein hydrolysates. The interdependency of caloric and protein intake in maintenance of nitrogen balance and body weight has been demonstrated.

Serum Amylase Study. This study was done to determine what mechanism regulates the serum amylase level and how elevations occur. The amylases are a group of enzymes which hydrolyze or split starch and glycogen into smaller units. Serum amylase levels were determined for five groups. Dogs were tested in four groups and human patients constituted the fifth group. Adrenocorticotropic hormone (ACTH) was given intramuscularly to the human patients and one group of dogs. One group of dogs was given cortisone and another group propylthiouracil; the remaining group received an injection of bile into the pancreatic duct. The data gathered supports the hypothesis that the serum amylase level is elevated with the release of ACTH.

INDUSTRIAL MEDICINE AND SURGERY

Vol. 26, November, 1957

*Employees' food services facilities. A medical department advisory and supervisory function. R. C. Conant.—p. 487.

Food Service Facilities. The practice and application of preventive and occupational medicine in industry extends into many regions of plant operations, not the least of which is the food service facility. The medical director of a plant has the obligation to provide adequate advisory and supervisory services for this operation. The extent of his duties in this sphere will, of course, depend on the size of the plant and the type of food service offered. Eating and diseases which may be spread through this essential function are of vital concern to the medical department.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 5, December, 1957

*Pesticide residues in milk. F. A. Vorhes, Jr. —p. 906.

*Protein quality of oat varieties. E. B. Weber, J. P. Thomas, R. Reder, A. M. Schlehuber, and D. A. Benton.—p. 926.

*Irradiation preservation of milk and milk products. J. H. Wertheim, R. N. Roychoudhury, J. Hoff, S. A. Goldblith, and B. E. Proctor.—p. 944.

Vol. 6, January, 1958

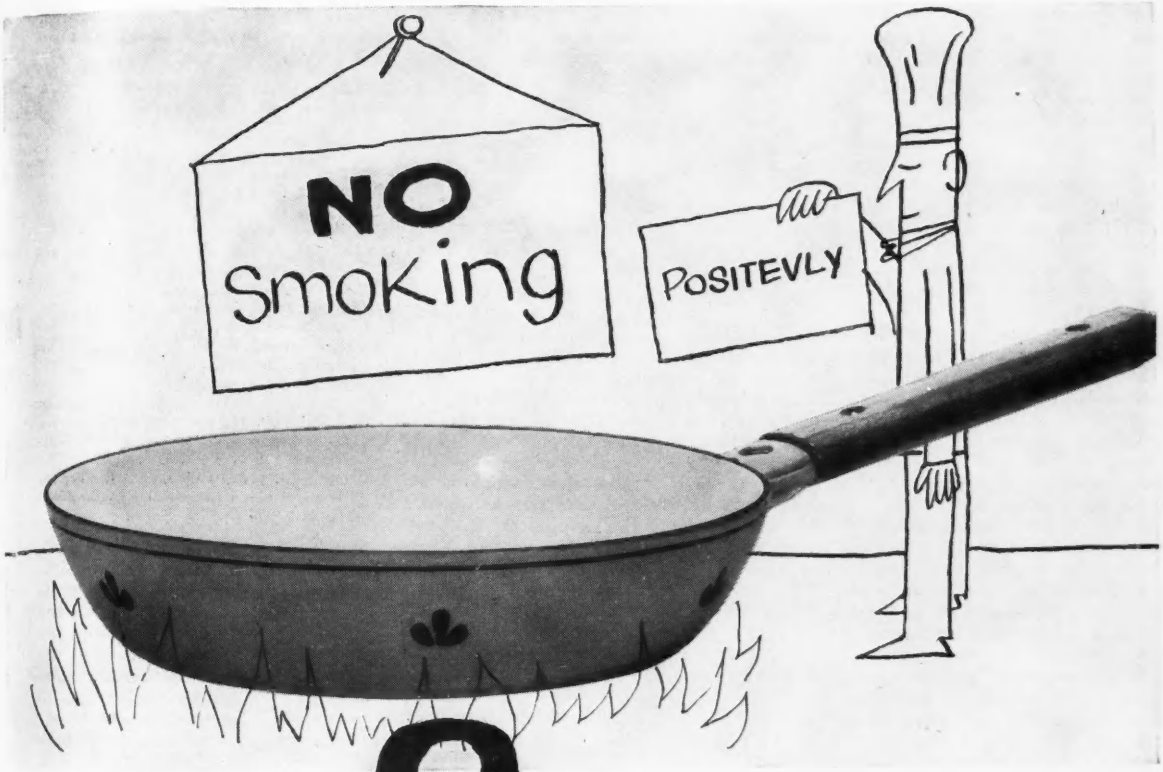
*Varietal differences in amylose content of rice starch. V. R. Williams, W.-T. Wu, H. Y. Tsai, and H. G. Bates.—p. 47.

*Nutritive values and utility of passion fruit by-products. K. K. Otagaki and H. Matsumoto.—p. 54.

*Effect of variety, location, and years on the protein and amino acid content of dried beans. E. M. Lantz, H. W. Gough, and A. M. Campbell.—p. 58.

*Variation in carotene content of sweet potatoes. B. D. Ezell and M. S. Wilcox.—p. 61.

Pesticide Residues in Milk. Milk has to be considered in a different light than some other foods in regard to pesticide residues, for milk is a widely consumed product and often by a segment of the population for whom potential harm by residues is the greatest. The weak, the sick, the very young, and the aged subsist mainly on milk. Not only must a tolerance be safe, but the use of the pesticide



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must be practical. Analysis is the only way to ascertain both these aspects. Pesticide residues are not necessarily identical with the parent pesticides. Many pesticides change in the course of becoming residues, and changes within animals may differ on where the pesticide has been contacted. These and other changes make the establishment of a safe tolerance for milk an undertaking of very considerable scope, complexity, and difficulty. However, there are favorable indications that these problems are not always insoluble.

Protein Quality of Oats. Comparison of sixteen varieties of oats was made by feeding them to rats as their sole source of protein. Consistent differences were observed between the nutritive values of some of the varieties. The levels of lysine and methionine in the protein of the oats were determined, but there was no correlation between the weight gains of the rats fed oat samples and the levels of lysine and methionine in the grain. Time and location of planting of oats were not important factors in determining the nutritive value of the oat proteins.

Milk Irradiation. Two reasons make it desirable to study problems encountered in the radiation preservation of milk. First, ionizing radiations result in stronger and more undesirable off-flavors than in any food, and experience gained on these flavor changes in milk may prove applicable to other less difficult foods. Second, milk is one of the few foods that can be separated into groups of components which can be studied independently and then evaluated by recombining them into milk again. In this study a method was developed by which milk or milk concentrates may be sterilized by cold sterilization free from detectable off-flavors. The increase in the sensitivity of irradiated milk to browning, caused by the formation of reductones, was further studied. The production of chalky off-flavors from milk fat was caused partly by the formation of peroxides of the more saturated components, whereas oxidized off-flavors were caused by highly unsaturated fractions of the butterfat.

Amylose in Rice Starch. The amylose content of a number of southern rice varieties was studied as part of a more extensive investigation of quality control in rice products. There was a consistent variation of amylose content with grain type, the longer grain varieties having the higher amylose content. Possibly this difference in starch composition is responsible for the known differences in cooking quality. No significant differences in amylose content attributable to date of planting were found.

Passion Fruit By-Products. Commercial processing of juice from the passion fruit for nectar, sherbet, punches, and other food products has been developed during the past years in Hawaii. About one-third of the weight of the fruit is juice. The rest is composed of rinds and seeds which present a serious disposal problem. Experiments were conducted to determine the nutritive value of these by-products as animal feeds. The by-products were satisfactory for supplementing or supplanting the carbonaceous feedstuffs for dairy cows. The seed oil can be used to supply the fat requirements of animals.

Nutrients in Dried Beans. Nine amino acids were determined microbiologically in eight varieties of dried beans grown for three years in one location and for one year in three locations. Differences due to location and years were highly significant for all amino acids on a milligram-per-gram basis and for seven and six amino acids, respectively, on a percent-of-protein basis. For some amino acids, variety differences, which were significant on a milligram-per-gram basis, were not significant when expressed as per cent of protein. The arginine content was affected most. The fact that the relative amounts of an amino acid affects its biologic value may be significant in planning dietaries of population groups eating large amounts of dried beans.

Sweet Potato Pigments. Samples of sweet potatoes taken from different sections of the same field were found to vary within a variety as much as 45 per cent in total carotenoids and 145 per cent in carotene. Potatoes from the same field averaged more than twice as much carotene one season as the next. Those grown with limited soil moisture were higher in carotene than those grown with abundant moisture. Individual roots from the same plant varied in carotene. The carotene content appears to be more closely associated with rate of growth of the root than with the size attained. Carotene content at harvest does not determine the amount of increase during storage, but in a season when all lots were relatively high in carotene at harvest, the increase during storage was also high.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Vol. 5, November, 1957

*Clinical uses of yogurt. H. Seneca and S. Gaymont.—p. 932.

Clinical Uses of Yogurt. Since yogurt can recolonize the colon with Lactobacilli, it has an important use clinically. In some cases, infantile diarrhea can be controlled by yogurt. During antibiotic therapy, sensitive organisms are killed, while resistant organisms grow unopposed, thus giving rise to superinfections. Yogurt can aid in inhibiting or controlling the bacteria causing the superinfection. By maintaining an effective population of Lactobacillus, acute and chronic bacterial and amebic infections may be inhibited. Yogurt is important in geriatrics in the proper functioning of the intestinal tract and as an easily digestible source of protein, calcium, and phosphorus.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 165, December 7, 1957

*Nutrition in the surgical patient. Editorials and Comment.—p. 1830.

*Loss of taste after tonsillectomy. Queries and Minor Notes.—p. 1898.

Vol. 165, December 14, 1957

*Treatment of postgastrectomy dumping syndrome by hypnotic suggestion. Preliminary report. A. S. Leonard, A. A. Papermaster, and O. H. Wangensteen.—p. 1957.

Vol. 165, December 21, 1957

*Phenylketonuria. S. W. Wright. Council on Foods and Nutrition.—p. 2079.

Vol. 165, December 28, 1957

*Spectrographic study of trace elements in cancerous and noncancerous human tissues. N. W. Tietz, E. F. Hirsch, and B. Neyman.—p. 2187.

*Vitamin D in dried milk and cod liver oil reduced. Foreign Letters–United Kingdom. —p. 2217.

Nutrition in the Surgical Patient. Many surgical patients receive nothing by mouth during the early postoperative period because of either the desire of the surgeon to keep the gastrointestinal tract at rest or anorexia. A commonly used method of maintaining surgical patients is to give them intravenously a 5 or 10 per cent sugar solution which may or may not contain some sodium chloride. This is not only deficient in calories but is devoid of utilizable nitrogen, essential electrolytes (notably potassium), and vitamins. Studies indicate that solutions of protein hydrolysates containing sugars, potassium, sodium, and chloride given in the immediate postoperative period can reduce destruction of body tissue. Testosterone propionate has been known to have an anabolic effect and can reduce the nitrogen deficit in the surgical patient and minimize or prevent weight loss. To give about 40 calories per kilogram to the average-sized patient intravenously, it is necessary to use either very hypertonic sugar solutions (25 to 50 per cent), alcohol, or fat emulsions. Experimental studies with the use of fat emulsions are being made, but many problems must be solved before they can be used routinely. Postoperative nutrition cannot be maintained only by concentrating on electrolyte balance and calories. Amino acids and vitamins must also be provided in adequate amounts. All under-nourished patients to whom large amounts of carbohydrate are given should receive supplements of the water-soluble vitamins.

Loss of Taste after Tonsillectomy. Loss of the sense of taste as a complication of tonsillectomy is rare. Probably some injury was done to the glossopharyngeal nerve, which supplies taste fibers to the posterior portion of the tongue. The anterior two-thirds of the tongue is supplied by the chorda tympani, and certainly could not have been injured during a tonsillectomy. It is conceivable that

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some scar tissue may have grown over from the tonsil area. If so, this should be removed. Also, the use of vitamin B_{12} injections several times a week, and the local application of 95 per cent alcohol to stimulate the taste buds might be considered. The sense of taste should return within eighteen months, if there is no central lesion of the brain causing loss of sense of taste and other complications.

Dumping Syndrome and Hypnosis. Causal agents of the post-gastrectomy dumping syndrome are not well understood. In this present study, six patients with the dumping syndrome were treated by hypnotic suggestion. Considerable improvement and rehabilitation was observed in each. It appears that psychologic factors play an important role in the onset of the dumping syndrome and that this symptom complex can be influenced favorably by hypnotic suggestion.

Phenylketonuria. Phenylketonuria is an inborn error involving protein metabolism and characterized clinically by a severe degree of mental defect, a lightening in the color of the skin, hair, and eyes, and a strong aromatic odor to the urine. A bizarre pattern of behavior may be observed. The disease occurs once in every 25,000 births and is transmitted as a simple Mendelian recessive characteristic. The biochemical defect is a failure to hydroxylate the amino acid, phenylalanine, to form tyrosine and results in the accumulation of excessive amounts of phenylalanine in the body and in its excretion, together with its derivatives, in the urine. There is a simple laboratory test which is usually diagnostic of the disease. Emphasis is placed on early detection, since treatment with a low-phenylalanine diet may be most effective in young infants. A commercial, phenylalanine-free diet preparation is now available consisting of an acid hydrolysate of casein with phenylalanine removed and supplemented with additional amino acids, minerals, and choline. Vitamins are not included and must be added to the diet together with carbohydrate and fat to meet caloric requirements. Cellulose may be added for bulk. Gastrointestinal distress and diarrhea are common in the initial stages of treatment. Weight loss, malnutrition, and acute protein deficiency may occur unless the total protein and caloric intake is maintained at a sufficient level. Serum protein or hemoglobin levels should be carefully followed for evidence of protein deficiency. Later milk or other protein foods should be added in small quantities to supply a small amount of phenylalaline, since it is an essential amino acid. It is not known yet how long the diet must be administered.

Trace Elements in Human Tissue. Autopsy and biopsy tissues of the lung, the liver, and kidney were analyzed in cancerous and noncancerous human tissues for their content of various trace elements. The results are given. The high content of elements not only in one organ tissue of patients with neoplasia, but in all three organs examined suggests that the storage of metals takes place prior to disease rather than after. The tissues analyzed came from specimens in the Chicago area.

Vitamin D Requirement. In Great Britain, the vitamin D content of dried milk is being reduced from a minimum of 280 I.U. per dry ounce to an average of 100, and of cod liver oil from 200 I.U. per gram to 100. This change was made because it was felt that an excessive intake of vitamin D can cause various illnesses in children. No change was made in the vitamin A and D tablets for expectant and nursing mothers.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 36, December, 1957

*Toxicity and blood ammonia rise resulting from intravenous amino acid administration in man: The protective effect of L-arginine. J. L. Fahey.—p. 1647.

*Unbound amino acid concentrations in human blood plasmas. R. H. McMenamy, C. C. Lund, and J. L. Oncley.—p. 1672.

*Serum iron levels in siderosis due to habitually excessive iron intake. J. Higginson, K. J. Keeley, M. Andersson, and A. R. P. Walker.—p. 1723.

Blood Ammonia Rise and Amino Acid Administration. Marked blood ammonia rise and toxicity have been demonstrated in man with intravenous administration of glycine or an L-amino acid mixture free of L-arginine but complete in the "essential" amino acids. The blood ammonia rise with intravenous amino acid administration appears to depend on the amount of amino acid and rate at which it is given, the ammonia-forming characteristics of the amino acids infused, and the state of nutrition of the host, particularly in relation to recent arginine intake. L-arginine was effective in reducing the blood ammonia rise and associated toxicity developing from these intravenous amino acid infusions. L-arginine may be given as part of the infusion or by intravenous injection immediately or some hours prior to the amino acid administration. If amino acid administration and the blood ammonia rise are already underway, injection of adequate amounts of L-arginine will rapidly reduce the blood ammonia rise.

Unbound Amino Acid Concentrations in Plasma. Unbound concentrations of eighteen individuals amino acids and a combined value for serine and glycine have been determined in plasma samples from fifteen normal subjects. The unbound concentration of glutamic acid and tryptophan are found to be low in plasma. At physiologic *p*H, tyrptophan is bound to a non-dialyzable plasma substance, probably protein, but is released on precipitation of the proteins with trichloroacetic acid. Recovery studies of amino acids added to plasma show that none were bound except tryptophan. Plasma levels of amino acids of patients in good nutritional status dropped an average of 34 per cent immediately after surgery. In three emaciated patients whose pre-operative levels were approximately 65 per cent of normal, no amino acid drop occurred after surgery. Alanine showed anomalous behavior. In the normal patients, the alanine level remained the same while the average of all the amino acids decreased 34 per cent. In the emaciated patient, the alanine level increased 50 per cent while the average of all amino acids remained the same. Thus the alanine in relation to the other amino acids increased postoperatively in both groups of patients studied.

Serum Iron Levels in Siderosis. Serum iron levels and the severity of siderosis as determined by liver biopsy were correlated in a series of twenty-six South African Bantu adults and one child derived from a population known to be habituated to an excessively high iron intake. The correlation between mean serum iron levels and the degree of siderosis was highly significant if the patients were divided into groups with and without significant hepatic deposits. There was no correlation between the serum iron levels and the severity of siderosis once significant iron deposition was present in the liver.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 29, October 1, 1957

*Nutritional levels and their seasonal variations in residents of Assam of different categories. B. Banerjee,—p. 280.

Nutritional Levels in Residents of Assam, India. A dietary survey of different groups of male and female subjects coming from middle class, lower middle class, and army camps was undertaken in summer and winter in Assam. It was observed that their nutrition dropped slightly in summer, that the males residing in hostels and army personnel had an all-around better diet than the rest, that the nutrient intake of all the groups was considerably below the recommendations of the U.S. Food and Nutrition Board, and of dietary standards of Great Britain, and that none of these groups showed any deficiency syndrome although their nutrient intake was lower than American and British recommendations.

THE JOURNAL OF NUTRITION

Vol. 63, November, 1957

*Periodontal disease in the rice rat. III. Survey of dietary influences. A. M. Auskaps, O. P. Gupta, and J. H. Shaw.—p. 325.

*The nutritive value of several foods grown at different locations. L. F. Gray, M. Speirs, and G. Matrone.—p. 345.

*The addition of small amounts of defatted fish flour to whole yellow corn, whole wheat, whole and milled rye, grain sorghum and millet. I. Influence on growth and protein efficiency. II. Nutritive value of the minerals in fish flour. B. Sure.—p. 409.

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*The effect of a low environmental temperature on the weight and food consumption of thiamine-deficient rats. D. A. Vaughan and L. N. Vaughan.—p. 417.

*Effect of ascorbic acid and of orange juice on calcium and phosphorus metabolism of women. J. M. Leichsenring, L. M. Norris, and M. L. Halbert.—p. 425.

*Excretion of certain nutrients by young college women consuming self-selected diets. F. I. Scoular, A. N. Davis, J. K. Pace, and A. B. Rankin.—p. 449.

*The improvement of the protein quality of white rice by lysine supplementation. H. R. Rosenberg and R. Culik.—p. 477.

Periodontal Disease in the Rice Rat. The rice rat is a relatively new experimental subject and is unusually susceptible to periodontal disease. It was found that laboratory chow pellets caused more severe manifestations than when the chow was a finely ground powder. Complete elimination of carbohydrate from the diet caused reductions in lesions. Reduced carbohydrate with additional lard tended to cause similar reductions of lesser degree. Supplementation with ascorbic acid and vitamins A and D had no influence on the lesions. It was suggested that high levels of B-complex supplementation caused minor reductions in lesions. Wide variations in the calcium and phosphorus levels and ratios in the diet had no influence on periodontal disease. Likewise, there was no effect by the addition of either 15 or 30 p.p.m. fluoride to the drinking water.

Location and Nutritive Value. Both the top environment (climate) and the root environment (soils) have been shown to affect the composition of plants significantly. This study investigated the relative nutritive value of several human foods—corn, cowpeas, and turnip greens—grown at widely different locations, as measured by the experimental animal. No difference was observed in the nutritive value of corn and cowpeas, but there was a difference in turnip greens.

Defatted Fish Flour with Grains. Data are presented on the influence of addition of 1, 3, and 5 per cent defatted fish flour to whole yellow corn, whole wheat, whole and milled rye, grain sorghum, and millet on growth and protein efficiency in rats. The greatest responses were obtained with grain sorghum, millet, and whole yellow corn.

Cold and Thiamine Deficiency. Most published thiamine requirements are now based on food intake. It is assumed that a major effect of cold on rats is an elevation of caloric intake. In this investigation weight changes and food intakes were measured in rats kept at two environmental temperatures and receiving adequate and suboptimal levels of dietary thiamine. There were no significant differences in weight loss or gain between the rats held at 25°C. and at 5°C. when the level of thiamine, expressed as micrograms per gram of food, was the same. The animals kept at 5°C. ate an approximately constant increment of food, about 43 calories daily, above the intake of those kept at 25°C. It appears that the portion of the appetite stimulated by the increased energy expenditure in cold is not subject to the anorexia induced by a thiamine deficiency.

Ascorbic Acid and Calcium Metabolism. The effect of the ingestion of moderate amounts of orange juice and of ascorbic acid on calcium and phosphorus metabolism in adult women was investigated. These minerals were supplied in amounts calculated to be slightly below the minimal needs for maintenance, since it was thought that at these levels any effects of the supplements would be more apparent. Calcium absorption and retention was significantly greater when the subjects were supplemented with orange juice or ascorbic acid. Neither orange juice nor ascorbic acid significantly influenced phosphorus utilization.

Excretion on Self-Selected Diets. This study reports the fecal and urinary values obtained for calories, protein, calcium, phosphorus, and magnesium during the first ten years of a long-time balance study of young college women consuming self-selected diets. The excretions were compared on the basis of height in centimeters. The greater the wet fecal weight per unit of height, the greater was fecal nutrient loss. Similarly, the higher the volume of urine per unit of height, the greater the urinary nutrient loss. The sixteen- to twenty-year-old girls, who consumed a high level of intake per unit of height, had more positive balances. This was also true of the group over twenty years of age with respect to protein and calcium intake, but not of phosphorus and magnesium.

Lysine Supplementation of Rice. The nutritive value of the protein of white polished rice can be improved significantly by supplementation with the first limiting amino acid, lysine, in amounts sufficient to bring this amino acid in balance with the second limiting amino acid. Weanling rats were fed diets containing 90 per cent precooked white polished rice supplemented with graded amounts of L-lysine • HCl. Substantial improvements in growth rate and in efficiency of food utilization were obtained with 0.05 to 0.10 per cent of L-lysine • HCl supplementation. This growth response was accompanied by a decrease in the amount of fat and by an increase in the amount of protein deposited in the liver.

JOURNAL OF PEDIATRICS

Vol. 51, November, 1957

*Seborrheic dermatitis of infants and Leiner's disease: A biotin deficiency. A. Nisenson.—p. 537.

Vol. 51, December, 1957

*Growth and development. I. Relation of birth weight in Negro infants to sex, maternal age, parity, prenatal care, and socio-economic status. E. P. Crump, C. P. Horton, J. Masuoka, and D. Ryan.—p. 678.

Dermatitis and Biotin. Seborrheic dermatitis and Leiner's disease, which are variants of the same disease, are associated with biotin deficiency. However, the basic requirements of biotin for the infant are unknown. Nine patients with seborrheic dermatitis and two with Leiner's disease showed marked improvement with biotin. The dosages used, although effective, were perhaps inadequate when compared with the dosage reported in the literature. The doses recommended, therefore, for Leiner's disease and severe cases of seborrheic dermatitis are 5 mg. biotin intramuscularly daily for seven to fourteen days. For milder cases, 2 to 4 mg. biotin orally for two to three weeks are recommended by some, and 10 mg. daily for twenty to thirty days by others. The results were better with parenteral than with oral administration of biotin. Five infants with seborrheic dermatitis were given injections of B-complex alone, with moderate improvement in the skin lesions. Since there is an interrelationship between biotin and B-complex, and since B-complex enhances the effect of biotin, it may be that better results would follow daily injections of B-complex along with the biotin. Feeding the nursing mother with a total of 1500 gm. liver over three- to five-day periods, or giving her two to four injections of 5 mg. biotin, will seemingly be as effective. There is also a relationship between the diet of the nursing mother and the incidence of these diseases, as shown by the increased number of cases of Leiner's disease following the war. The improvement of the diet of both mother and infant as well as the diminution of breast feeding in this country may account for the infrequency of Leiner's disease. Foods high in biotin content, such as liver, egg yolk, kidney, and yeast, are most effective when fed directly to the nursing mother, who can utilize biotin better than the infant. Biotin is seemingly without value in seborrheic dermatitis of the older child and adult, which suggests a disease of different etiology.

Birth Weight in Negro Infants. Negro infants are smaller at birth than white babies. It has not been shown, however, that this is exclusively a racial characteristic. There is considerable evidence that the Negro, for the most part, is economically an underprivileged group, when compared to the whites. Data in the present study tend to show that there is direct relationship between small babies at birth and certain conditions more common to the Negro mother. She is younger than the average white mother at conception and the direct influence of youthfulness in reducing birth weight is demonstrated. A similar relationship is demonstrated statistically between birth weight and prenatal supervision and care. There is also a direct relationship between socio-economic status of the Negro mothers and the average birth weight of infants within each socio-economic group. It is suggested that when these various determining factors converge

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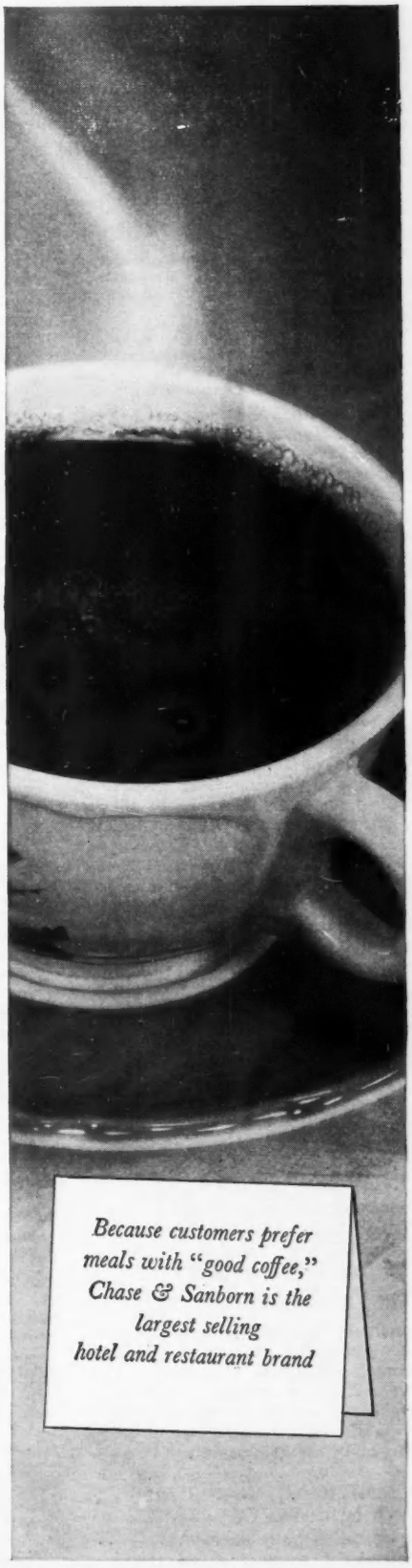

on Negro women, a summation effect is manifested by the smaller infants they produce. It is apparent from the study reported that the range of differences in birth weight existing among Negro infants is similar to white infants and the data presented tend to explain these differences on the basis of influences unrelated to racial origin.

THE LANCET

No. 6995, September 21, 1957

*Effect of long-chain polyunsaturated and saturated fatty acids on the serum-lipids of man. L. Horlick and B. M. Craig.—p. 566.

No. 7005, November 30, 1957

*Effect of amphenone therapy on urinary excretion of aldosterone and sodium intake in hepatic cirrhosis with ascites. W. H. Sumerskill and J. Crabbe.—1091.

Unsaturated and Saturated Fatty Acids in Man. In feeding experiments in healthy young adults, the serum cholesterol was depressed equally by removing animal fat from the diet or by substituting corn oil or ethyl linoleate. After a low-fat diet or a diet containing ethyl linoleate, the serum cholesterol was not raised by giving ethyl stearate as the principal dietary fat, though fecal studies showed that 65 to 70 per cent of it was absorbed when the intake equalled 25 per cent of the total calories.

Amphenone Therapy and Hepatic Cirrhosis with Ascites. Amphenone, which depresses adrenocortical function, was given to four patients with ascites complicating liver disease in divided doses totalling 11 to 18 gm. in three or four days. Two patients had more severe liver disease, and their ascites did not respond to bed rest, sodium restriction, and mercurial diuretics. In both cases amphenone therapy was followed by an increase in urinary excretion of sodium from less than 1 mEq to 60 to 80 mEq in 24 hr. Amphenone had no effect in the other two patients who responded to routine treatment. The urinary excretion of aldosterone was increased in both patients in whom it was estimated, the unconjugated fraction being abnormally high, and levels fell promptly to normal when amphenone was given. Prednisone, administered as a precaution against toxic effects, led to a small sodium diuresis in one patient but did not alter the excretion of aldosterone. Amphenone had no effect on liver function tests and serum electrolyte levels, but both patients in whom the urinary excretion of sodium was increased developed transient impending hepatic coma. Since increased production of aldosterone is important in ascites, depression of adrenocortical function by amphenone or drugs with a similar action should be considered in treatment of intractable ascites.

THE MILBANK MEMORIAL FUND QUARTERLY

Vol. 35, October, 1957

*Maternal and newborn nutrition studies at Philadelphia Lying-In Hospital. Newborn studies. V. Size and growth of babies during the first year of life. R. V. Kasius, A. Randall, IV, W. T. Tompkins, and D. G. Wiehl.—p. 323.

*The influence of war and post-war conditions on the teeth of Norwegian school children. III. Discussion of food supply and dental condition in Norway and other European countries. G. Toverud.—p. 373.

Newborn Nutritional Studies. This fifth report in a series of nutritional studies is in regard to the size and growth of babies during the first year of life. The purpose of this entire study was to determine the effect of nutrient supplements in pregnant women's diets on the physical status of the infant. No association was found between the supplements and size and growth of the infants. Data on the measurements of weight, chest circumference, crown-sole length, crown-rump length, rump-sole length, hip breadth, head circumference, and calf circumference at birth and at three, six, and twelve months of age are presented in this report for 1391 white and Negro infants. The mean values of these measurements are almost always larger for males than for females at each age. The means for the white babies are usually larger than those for Negroes of the same sex except for rump-sole length and head circumference. The correlation coefficients between the increments in each interval are presented. Weight gain is most highly correlated with the increments of the other measurements while the association of growth in rump-sole length with the other increments is usually near zero. Other correlations of measurements are also presented.

Teeth of Norwegian Children. This report, which is third in a series, summarizes data from other studies in Norway and in various European countries on the amount of dental caries during and after the war. Data on changes in consumption of different kinds of food during these years are also presented. It is felt that the change in mouth environment brought about by the drastic reduction in consumption of sugar during the war was the main cause of reduced caries rate. An increased tooth resistance, which may be due chiefly to more favorable conditions for the earliest posteruptive maturation of the enamel surface, seems to have acted as a second factor. The post-war increase in the caries rate can be ascribed chiefly to gradual changes towards prewar consumption of foods. Evidence on the influence of dietary changes on the condition of the teeth is evaluated.

MILITARY MEDICINE

Vol. 121, October, 1957

*Air force nutrition in flight. A. A. Taylor and H. C. Dyme.—p. 238.

Nutrition in Flight. In flight, such factors as barometric pressure and its sudden change, rapid temperature fluctuations, abnormal oxygen tension, turbulence, vibration, crowding, restrictive clothing, and cramped position affect the palatability of foods. Many things make men accident prone — tension, anxiety, irritation, fatigue, monotony, drowsiness, and discomfort. Aside from meeting nutritional requirements, the serving of food and drink, through long established social custom, relieves boredom, eases tension, soothes irritation, increases alterness, and counteracts stress. In addition to fuel values, standards for flight feeding must consider: (a) quality; (b) balance—the proper proportion of protein, fats, and carbohydrates, and all of the various specific nutrients, such as vitamins; (c) timing—light, frequent feedings are better than heavy, infrequent meals; and (d) water—proper fluid intake to prevent dehydration is of great importance. The standard types of flight meals presently authorized by the Air Force are described: (a) the Sandwich Meal or box lunch; (b) Food Packet, Individual, In-Flight; (c) Precooked Frozen Meals; (d) Precooked Hot Meal; and (e) Foil Pack Flight Feeding System.

NEW YORK STATE JOURNAL OF MEDICINE

Vol. 57, December 1, 1957

*A five-year follow-up on a method of increasing the glucose tolerance test with corticotropin. H. Berger.—p. 3825.

Glucose Tolerance Test with Corticotropin. It would seem that the glucose tolerance test preceded by the intramuscular injection of ACTH may detect diabetes in individuals who show no other clinical or laboratory manifestations of the disease. Nine of the sixteen patients who reacted positively to the ACTH glucose tolerance test five years ago were retested. Four may now be considered diabetics. Two have abnormal glucose tolerance tests but no other evidences of the disease. Two have glycosuria, and one of these required insulin. This latter patient was a member of a coterie of individuals used as normal controls. It is particularly significant that the test picked him out of such a group. He should not have developed diabetes since he had a negative family history. Such a case constitutes the strongest argument for the possibility of value in this method of screening for the detection of diabetes. No diabetes was discovered among those who did not react positively to the test. In a disease as common as diabetes this is a very small series indeed. Therefore, conclusions are inferred.

NUTRITION REVIEWS

Vol. 15, December, 1957

*Fatness, fat and coronary heart disease. R. S. Gubner.—p. 353.

Fatness, Fat, and Coronary Heart Disease. The relationship between the accumulation of excess weight and the development of cardiovascular disease

a new look at BANANAS

Some years ago there was a widely prevailing notion that bananas were indigestible. Today they are prescribed as one of the first solid foods fed to infants.

For the past few years many patients have had the idea, equally erroneous, that bananas are "fattening." The fact, of course, is that bananas—like fruits as a class—are relatively low in calories. There are only 88 calories in a medium banana, according to the U.S. Department of Agriculture. (Handbook No. 8, Composition of Foods.)

And so another bugaboo is laid to rest.

There is no reason to omit bananas from reducing diets. There are a wealth of reasons to include them:

- *A wide range of vitamins and minerals in good balance with calories.*
- *Calories provided both as simple sugars for quick energy and as less soluble carbohydrates for sustained vitality.*
- *High satiety value for appetite control.*
- *Pectins and carbohydrates to aid digestion.*
- *Extremely low fat content—less than 0.2 per cent.*
- *Sweet mellow flavor that rates high in patient acceptance.*

In addition, clinical experience has demonstrated the banana's regulatory effect on gastrointestinal function, and its value in the correction of both diarrhea and constipation.

A new look at bananas demonstrates their place in every reducing diet—and every normal or maintenance diet, too.

Bananas belong in the daily diet

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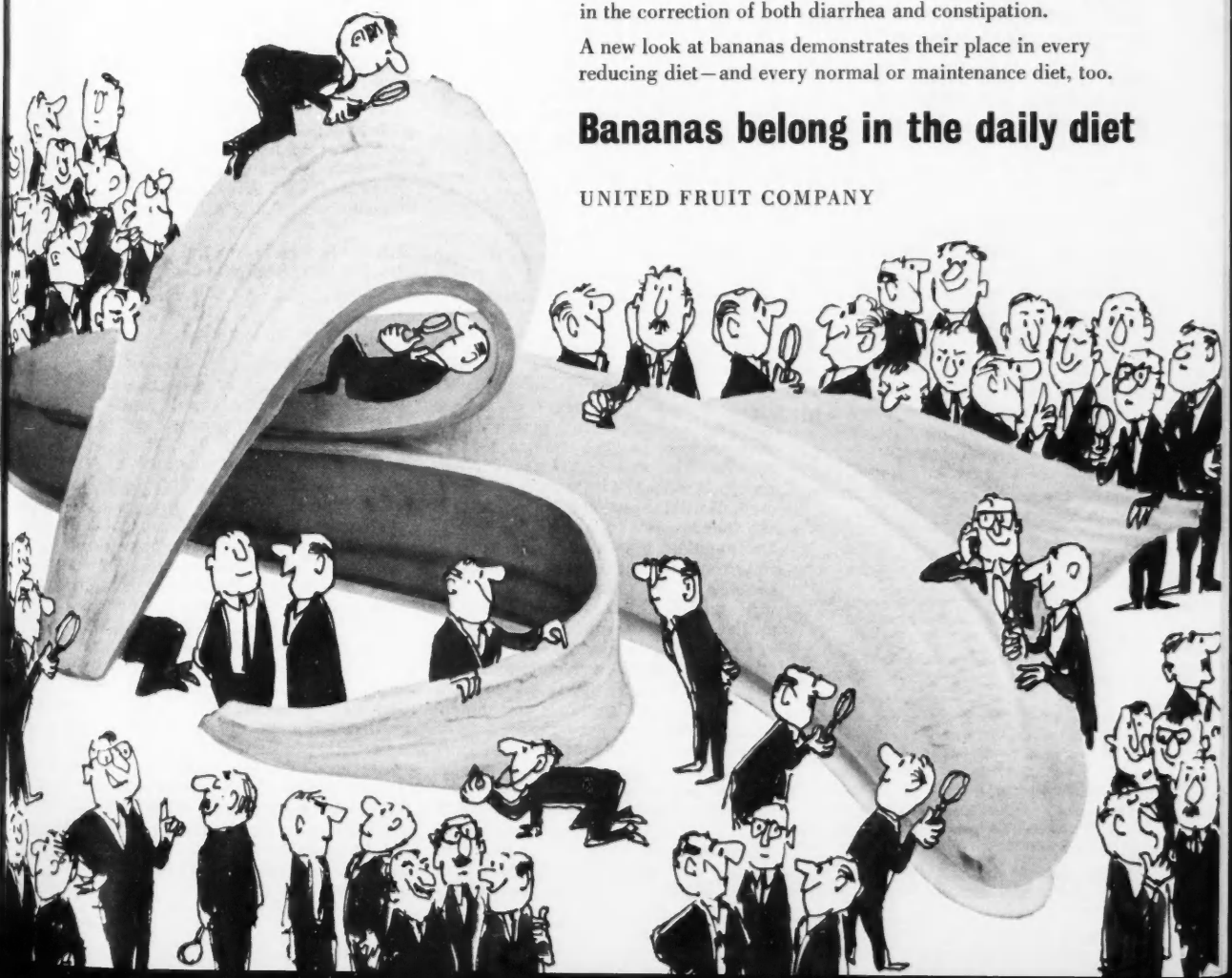

is discussed in this article. The World Health Organization and some other researchers feel that there is no convincing evidence that relative obesity is a major factor in atherogenesis. Several insurance studies, including the Equitable Life, reveal that mortality rates rose with increasing degrees of overweight. Results of these studies are given. Although coronary disease and atherosclerosis are usually considered the same thing, it is increasingly evident that there are differences. While a relationship exists between fatness and coronary heart disease, no such association obtains for arteriosclerosis in other sites, as in the aorta. There are no firm conclusions which can presently be drawn with respect to control of the lipid factors in coronary disease. Some workers feel that serum cholesterol, *per se*, must be lowered, irrespective of the means, if benefits are to result. It appears, however, at least concerning the thrombotic factor in coronary disease, that cholesterol is not the only noxious agent, and fats and phospholipids merit more attention. At present it would appear more practical to maintain low levels of serum fat. If the visible result of measures to reduce lipemia is a lean and vigorous population, there may be less coronary disease than now exists in our presently relatively obese and physically inactive American populace.

ROYAL SOCIETY FOR THE PROMOTION OF HEALTH JOURNAL

Vol. 77, November-December, 1957

*The nature of the agents which attack food, with special reference to meat. A. G. Kitchell.—p. 808.

Food-Attacking Agents. The microorganisms considered in this paper are bacteria, yeasts, and molds which attack foods. There is special reference to meat. The growth of micro-organisms depends on many factors, some environmental and some innate. Various aspects of growth are discussed, including: the nutrient status of the substrate, the presence or absence of oxygen, temperature, relative humidity, acidity, and their own metabolism. Practical significance of these organisms is considered in food preservation and in hygiene.

SCIENCE

Vol. 126, November 1, 1957

*Man against his environment: the next hundred years. J. M. Luck.—p. 903.

Vol. 126, December 6, 1957

*Antibiotics in food preservation. Public health and regulatory aspects. H. Welch.—p. 1159.

*Dietary calcium levels and retention of radiostrontium in the growing rate. R. H. Wasserman, C. L. Comar, and D. Papadopoulou.—p. 1182.

Vol. 127, January 3, 1958

*Evidence for a new growth-promoting acid produced by Lactobacillus casei. M. N. Camien and M. S. Dunn.—p. 27.

Man Against His Environment. Because of the acceleration in population growth, it is now evident that a mere 100 to 125 years will be required for the next quadrupling of the population. Clearly, the more pertinent question is whether the world of 2050 will be able to raise enough food to support a population of 9000 million. The answer appears to be that it will be able to do so in a sort of way, although the present inequalities in distribution will be accentuated. One of the basic rules in human nutrition is that, in an ideal diet, a third to a half of the protein intake should be derived from animal sources because they contain certain indispensable amino acids not present in adequate amounts in cereals. All of these can be synthesized in the laboratory, and the manufacture of amino acids is developing into a sizable industry. We may also learn to extract the nutritious proteins of leaves on a sufficiently vast scale to use them effectively as food supplements. To feed 9000 million, even at minimum levels, it is reasonably certain that vast sums will have to be expended in land reclamation, in the prevention of further erosion, in the manufacture of fertilizers, in the husbanding of nitrogenous and phosphorus - containing wastes, and in irrigation and water conservation. Fisheries will be extended into the southern waters of the globe. Domestic animals, whether used for food or for work, will be displaced—the former by the synthetic products of the food industry, the latter by machines. The harvesting and cropping of food from the oceans and fresh waters of the earth will be done much more efficiently, and the cultivation of bacteria, yeasts, and photosynthetic algae for human food will be further developed where regional conditions are appropriate; sunlight and carbon dioxide are needed for the cultivation of the bacteria and algae, and rich carbohydrate wastes are needed for the former.

Antibiotics in Food Preservation. As more uses are found for antibiotics in foods, the responsibility of seeing that such foods are safe is a growing concern. This article deals with public health and regulatory aspects. The side reactions of sensitivity to antibiotics must be considered. Antibiotics have an important use therapeutically, and 10 per cent of the population is said to be susceptible to sensitization. The inadvertent contact of these people, through eating and drinking foods containing antibiotics, is of concern. Antibiotics are also used in animal feeds and as crop sprays. These are not thought to constitute a public health hazard. The Miller Pesticide Chemicals amendment to the Food, Drug, and Cosmetic Act, passed in 1954, controls tolerance levels and residues of antibiotics used as food preservatives. Indirect means of contaminating foods with antibiotics poses another problem. Penicillin in milk supplies from cows treated for mastitis is an example. The U.S.D.A. has attempted to educate farmers concerning this. If control over penicillin in milk is not improved, it may be necessary to ban its use in mastitis preparations. The control of antibiotics in our food supply becomes more complex daily as more uses are found for more antibiotics. Discretion must be used in each new proposal.

Calcium and Retention of Radiostrontium. The contamination of dietary sources of calcium with radiostrontium has led to a consideration of methods by which the absorption and retention of dietary radiostrontium can be reduced. The data reported here do not imply that remedial measures are now necessary and do not evaluate the practical application of such methods. The present study was designed on rats to determine whether radiostrontium intake and deposition are governed by the calcium intake and whether, on a longer-term basis, supplementing the diet with uncontaminated calcium would quantitatively reduce the retention of ingested radiostrontium. The latter was shown, i.e., uncontaminated calcium in the diet of the rat will proportionally decrease the fractional retention of continuously ingested radiostrontium under the conditions of this experiment. Further investigations need to be done to determine whether these relationships hold over a broader range of variables and whether these findings are applicable to man.

New Growth-Promoting Acid. This investigation reveals that the growth stimulant to be found in cultures of *L. casei* is not D-lactic acid, but a more lipophilic acid, possibly a higher homolog of D-lactic acid.

UNITED STATES ARMED FORCES MEDICAL JOURNAL

Vol. 8, December, 1957

*Potable water on submarines. A. D. James and W. R. Sanborn.—p. 1792.

Potable Water. Contamination of potable water with sewage, polluted water, or other nonpotable liquid presents a perennial hazard in public health, particularly aboard ship or within a submarine. Study of the potable water systems of submarines in a typical squadron disclosed discrepancies both in equipment and in procedures. Positive tests for coliform organisms were obtained from 8.7 per cent of 254 submarine tanks from one shipyard, but from only 1.9 per cent of 107 tanks from another shipyard, suggesting a relation to type of construction and nature of equipment. Of eight potential sources of contamination observed, six had to do with equipment or construction and two with procedure. The results indicate need for emphasis on proper handling procedures, a regular check of potable water tanks for contamination, and a more complete and detailed study of causes of contamination of potable water tanks aboard submarines.

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Instant Ralston (or Regular Ralston) perks up the palates of patients on sodium-restricted diets because it doesn't depend on salt for flavor. It's just naturally full of the flavor of whole-grain wheat — much heartier than most low-sodium foods. And an average serving (2/3 to 3/4 cup cooked) contains only .35 milligrams of sodium. Ralston's added wheat germ provides high quality protein, too, as well as appetite-building B vitamins. Instant Ralston cooks in just 10 seconds; Regular Ralston in 5 minutes.
INSTANT RALSTON and REGULAR RALSTON, the power-packing cereals from Checkerboard Square

AMERICAN RESTAURANT

Vol. 41, December, 1957

*Profit blueprints for modern restaurant operation. G. L. Wenzel.—p. 17.

*Restaurant labor.—p. 38.

Profit Blueprint. There are seven factors that determine menu prices: competition, quality of food, portion sizes, cost per plate, type of customer, atmosphere, and volume. The author suggests that in the right atmosphere any price goes and that volume depends on skill in turning out quality food, in proper portion sizes, to satisfy the type of people most abundant in the area, in an atmosphere likely to encourage repeated visits. Volume and atmosphere appear to be the most legitimate of currently used pricing techniques, since a national portion and menu price study has revealed such a lack of uniformity of portion sizes and menu price techniques based on known costs, that anything apparently goes. However, with the tide turning toward more science in management, the author says certain principles can be followed in fixing portions and prices and maintaining quality. First, all menu items should have a 40 per cent food cost or lower, and many should be featured with a 33 per cent food cost. Second, since the human stomach holds 40 oz. when normally distended, a dinner should provide close to that amount of food with portions divided to balance each other and total that amount. Quality can be maintained by the use of seasonal foods. On the subject of quality, the author mentions that not one restaurant in a hundred surveyed buys better types of hamburger, and that quality is a decidedly important menu pricing factor which ignores the cheapening "competition" phobia.

Restaurant Labor. Prescriptions for management faced with the possibility of unionism are given here. It is recommended that restaurant managers keep improving wages, be available to hear grievances, and make rules and regulations that are not set up on an autocratic basis. Also recommended: make it possible for every capable employee to become something higher in the organization. The whole object of improvements in management's treatment of employees is to eliminate the feeling that only through a union can conditions be improved or corrected. To create more regard for jobs and the place of business, it is recommended that jobs be designated with names that fit and do not degrade the work; that workers be employed who command the respect of other employees and the public; that the individual personality of the employee be respected; that employees be publicized favorably; and, that employees be given proper training. Final suggestions include: make a review of conditions and wages every six months; make it possible for employees to earn more by longer hours of work; make sure that capable men are provided with work equal to their abilities; make sure jobs are graded and paid properly; and finally, look at employment conditions from the vantage point of the lowest employee.

FOOD ENGINEERING

Vol. 29, December, 1957

*Food irradiation makes strides.—p. 57.

*How can you communicate with workers? I. C. Miller.—p. 61.

*What can you expect in tomorrow's food market?—p. 64.

Progress in Food Irradiation. More than a hundred irradiated food items have already been cleared for human testing by the Office of the Surgeon General, U.S. Army, following animal-feeding tests. The majority have now been subjected to taste evaluation. The most promising appear to be bacon, green beans, and peaches, which have withstood one year of 72°F. storage. After doses of nearly 2 million rads, bacon, beef roast, veal roast, pork roast, beef steak, pork chops, and lamb chops were all deemed acceptable by panels of more than one hundred observers. However, some of these treated foods possessed flavors and odors distinct from those of normal or customary products. Preliminary evidence indicates that doses required to sterilize meat can be reduced by precooking or by early application of antibiotics. Radio-pasteurization doses have been successfully applied to fresh strawberries, lemons, oranges, and peaches at doses which would not normally produce significant changes in acceptance. Other news includes the announcement that human volunteers have already consumed a 100 per cent diet of irradiated food for twelve weeks without any adverse physiologic effect. Package testing has proved tinplate metal to be the most satisfactory container to date. The Quartermaster's project is utilizing ten major sources of irradiation, including electron beams, X-rays, and gamma rays. The major portion of food irradiation is with gamma rays.

Worker Communications. The way management acts and the things management does, as well as everything management says—and how it says it—are critical areas of communications. One of the simplest communication tools which can be used by large and small plants with equal ease and effectiveness is the workers' bulletin board. Boards can be the backbone vehicle for getting across management messages and ideas accurately, authoritatively, and convincingly. Eye-catching color and arrangement and lively items of interest are the keys to success. Persistent interest of management plus creative ability in whoever is responsible for board operations can build good communications in the plant. The boards should display the things employees want to read—usually information about the company and about their jobs, safety cautions, suggestion awards, vacation and holiday schedules, news about company products, employee activities, and so on.

The Market Tomorrow. Although the basic factor in predicting market trends is people, it is fallacious to base long-range marketing plans solely on population growth. Certain trends in consumer food-buying habits will have important influences on the market. To keep pace with the uptrend in productive capacity and living standards, for example, it will be necessary for manufacturers to increase sales 50 per cent even though population growth is projected for the period 1958-68 at 18 per cent. Food habits then, must account for two-thirds of the 50 per cent potential increase if the market is to meet the challenge of commanding its share of increased consumer capacity. Advertising and selling will have to bear the burden of upgrading and changing food habits. Rapid changes in marketing concepts must come as a result of these noted trends: (a) increased purchasing power; (b) higher education levels; (c) more women workers; (d) more leisure time; (e) new family attitudes; (f) new family formations; (g) population mobility; (h) more suburban living and self-service; and (i) continued growth of advertising influence.

HOSPITAL MANAGEMENT

Vol. 85, January, 1958

*Breakfast needn't be monotonous. D. H. Zumsteg.—p. 110.

Breakfast Variety. Some recent innovations in breakfast menus prove that monotony can be banished from this first important meal of the day. Cases in point include: strawberry ice cream served with hot cereal; a combination of sautéed apple slices, sausages, and corn muffins with sirup; and, creamed chipped beef on toast. Analysis shows that these meals are no heavier than the usual ham-and-egg breakfasts served with milk and toast, and, they provide all the necessary nutrients in well balanced amounts.

HOSPITALS

Vol. 31, November 16, 1957

*How to control food-borne disease in the hospital. L. D. Stauffer.—p. 80.

What's new in food service?—p. 98.

Vol. 31, December 1, 1957

*The art of decision making. R. D. Vanderwarker.—p. 36.

Vol. 31, December 16, 1957

*Polling patients and personnel, part 4. What hospitals have done to improve patient care. F. G. Abdellah and E. Levine.—p. 43.

*Fat filtration improved fried foods and cut costs. E. A. Mosso.—p. 60.

Vol. 32, January 1, 1958

*How to prepare dietary budgets for smaller hospitals. J. Hartman.—p. 84.

Environmental Health and Safety. Food sanitation is often taken for granted in the pressure of preparing meals for hospital patients. It is imperative that hospitals take proper precautions in serving food under sanitary conditions to the patient. Eliminating one of the links in the

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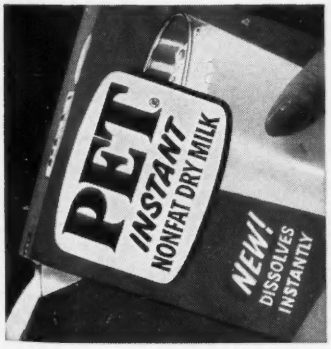

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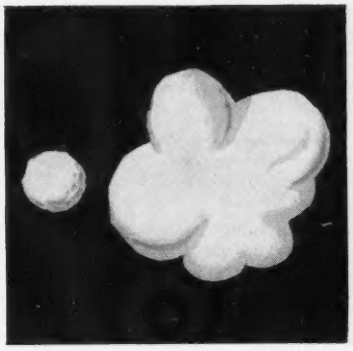

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chain of disease transmission involves the following factors: (a) the purchase and proper storage of clean, wholesome, high quality food and drink; (b) provision and maintenance of adequate food preparation and serving facilities; (c) proper refrigeration, cooking, and food preparation techniques; (d) properly protected transportation and service of food to patients; and (e) properly informed, healthy workers at every step in the food service operation. Various facets of these areas of food production, as regards to sanitation, are discussed.

Decisions—How to Make Them. The hard-pressed executive is generally faced with two types of decision processes in his job. The first is the tactical decision which involves thinking along known and simple lines. The second, called strategic decision-making, involves thinking of a higher and more creative order. To help executives handle the strategic thinking process more easily, the author recommends following these steps. When making decisions, define the problem completely; analyze the problem; developed alternative solutions; select the best solution; and, make the decision effective. The strategic decision of a long-range nature, concerned with major matters of policy and planning, is one the administrator should be most familiar with. In his difficult role as a decision maker, he should not lull himself into a false sense of serenity but must recognize the situation for what it is and handle it without becoming harassed. The knack of involving others appropriately in the decision-making process will make his going smoother and the decisions firmer.

Improved Patient Care. Improvement in hospital food can be accomplished through both management and equipment changes. Suggestions which might be helpful in achieving better service to patients include the following: (a) serve trays at times convenient to all and see that nursing personnel are back from lunch before the trays are served; (b) serve convalescent patients in a dining room area; (c) have dietary aides carry trays to the patient's bedside; and (d) relieve the dietitian of clerical work by providing her with a secretary. Try vacuum bottles for ice water and vacuum-sealed plates to keep food hot. Use tray chutes or conveyor belt from the diet kitchen to expedite serving. Other suggestions that the dietitian make rounds and talk with patients and that ideas can be obtained from other institutions regarding equipment and methods used in the dietary department are also given.

Filtration Improves Fried Foods. St. Luke's Hospital, New York City, has effected more than a 50 per cent saving in fats and oils by stretching the useful life of these materials with a portable, automatic filtering machine. The unit draws the fat from the fryer, removes impurities and odors, and pumps it back into the fryer in minutes. The fat is filtered after each use, foods look and taste better, and the filter reduces the time and labor required to handle the fat and clean the fryer. The danger of bad burns is eliminated because manual handling of hot fat is no longer necessary.

Dietary Budgets for Small Hospitals. Expenses of the dietary department in the small hospital should be divided among certain categories. These categories should be considered and analyzed four ways: projected expense for the year; past experience and expense; proposed budget for the coming year; and justification of the item, amount or change recorded. The budget categories are as follows: payroll, which should include money for labor turnover, vacation relief, and sick leave plus salary increases; food, planned on the basis of raw cost per day per person; supplies and materials or expendable equipment; repairs and maintenance; and, under a separate "capital expenditures budget," additional equipment. The budget should be set up to cover a reasonable period of time. The most commonly used period is one year. The progress of expenditures as compared with the planned budget should be reported to the department head on a monthly and quarterly basis and cumulatively for the year.

INSTITUTIONS

Vol. 42, January, 1958

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Selecting Equipment. To be certain of getting what you want when you buy equipment, be sure to prepare a detailed specification covering your requirements and make sure all bidders *follow* your specifications. Watch out for workmanship. Be sure it is specified by type equal to manufacturer A or B. Be sure, too, that equipment is constructed in accordance with National Sanitation Foundation standards and complies with all local ordinances. If brand names are used in conjunction with the "or equal" clause, be sure that any substitutions offered are really equal. Before approving substitutes, make certain they will operate on your utility outlets and that your specifications call for inspection and approval of equipment before it is installed, preferably in the manufacturer's shop, if convenient. This includes testing of gauges of material used. Describe sizes, materials, and methods of construction in minute detail. Specific criteria applying to the selection of equipment for steam cookery, holding hot food, for the main cooking battery, and for baking are given.

Sanitation for Food Workers. Here is the second lesson in a sanitation course for food service workers. It deals with food-borne diseases and bacterial food poisoning in particular. The two major types of bacterial food poisoning are intoxication and food infection. Staphylococcus food poisoning is the most common and belongs to the food intoxication group. It is transmitted to food by workers infected with pimples, boils, and carbuncles and in the nasal drip of colds. Foods most often infected are tenderized hams, custard-filled baked goods, salads, chopped foods, and cured meats. Food may contain sufficient toxin to produce violent illness and yet have no odor of spoilage or abnormal taste. Staphylococcus is resistant to heat and cold and can only be made less toxic by heating foods to 375°F. for 30 min. Research work shows that no toxin is found in foods at temperatures below 45°F. unless it already existed previously at higher temperatures. Another food intoxication type is botulism. This disease is usually fatal and is caused by the toxin produced by the rod-shaped bacterium called *Clostridium botulinus*. Botulism germs are found in the soil and gain access to foods through contact with soil dust and possibly water. The foods most often contaminated are either canned or fermented, since these foods do not come in contact with air in their containers. Commercially canned goods are considered safe as they are prepared under approved controls, but home canned goods have been implicated in many botulism outbreaks. The organisms sometimes produce a gas and a cheesy odor in foods, but not always. It can be destroyed along with its poisonous toxins if food is boiled for 10 to 15 min. and thoroughly mixed so that all parts of the food may reach the minimum temperature.

Selecting Quality Beef. A definite trend in quantity food operations today is the purchase of wholesale cuts and carcasses of moderate weight and moderate finish in contrast to extra large, highly finished carcasses. Beef of the highest grade has a large proportion of lean to bone. The lean is firm, fine-textured, and bright red in color. It is also well marbled with fat. The bones are red and porous indicating that the beef is from a young animal. This type of beef is produced by steers and heifers bred and fed for meat production and slaughtered as yearlings or two-year-olds. Most beef reaches the market one to two weeks after slaughter unless aged or

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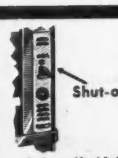

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ripened. Only the better grades of beef with sufficient external fat covering and with lean, firm meat, will age. Grade and brand stamps that are affixed to meat are of two types —the grade names of the U.S.D.A. and the grade and brand names of individual packers. U.S.D.A. grades are: Prime, Choice, Good, Standard, Commercial, and Utility. Fresh and chilled meats should be held in sanitary refrigerators at 33° to 36°F. This temperature range should be carefully regulated so that the minimum does not fall below 33°F. Frozen meats require 0°F., and if they are to be held for a long period of time, −10°F. Ground meat, unless frozen, should not be held longer than 24 hours. New methods of prolonging the storage life of meats at less cost are currently being investigated. There is a good possibility that the future will see preservation of meats by antibiotics, irradiation, and freeze-drying techniques.

Beef Purchasing. Notwithstanding the many advantages of the modern system of purchasing fabricated and portion-ready meats, one disability appears to be the greater perishability of such meats, as the area exposed to contamination in such meats is increased many times. Simultaneously, the time elapsing between cutting and cooking is increased. Prefabricated and portion-ready meats must be handled expeditiously and refrigerated promptly at proper temperatures. These problems are not as acute, when the buyer purchases primal cuts—the trimmed and untrimmed cuts—which are frequently designated "hotel cuts." They include: round, rump, sirloin, short loin, flank, rib, short plate, regular chuck, brisket, and shank. When buying these cuts, the purchaser should have specifications concerning the cut, grade, weight, and trim, at hand. If the buyer is having the meat cut to his own specifications, details of the order should include the area from which the cut will come, average weight, type of cutting or trim, depth of fat covering, quantity of bone allowed, or how it should be removed. Receiving procedures should be unvaryingly strict: (a) inspect meat for quality: (b) weigh meat to see that all items conform to the weights specified; (c) write weights on separate pieces of paper to be checked with those on the invoice; (d) measure specific items for cut and trim; (e) immediately report any differences; (f) refrigerate meat properly.

Beef Specialties. To get the best results in roasting meat, the oven should be kept between a low of 250°F. and a high of 350°F. If a large roast is to be cooked directly from the refrigerated or frozen state, oven temperature should be higher and as the heat falls, the thermostat should be kept at 300°F. The old idea that searing meat keeps in the juices has been disproved. Searing increases shrinkage but some cuts of meat are still seared to improve the appearance. The internal temperature to which the roast is cooked may influence its shrinkage as much as the oven temperature, so a meat thermometer should always be used in conjunction with the oven regulator. When broiling, remember to cook thick steaks from 3 to 5 in. from the direct source of heat. Thin steaks should be placed about 3 in. away. Less tender cuts should be cooked in moist heat by methods such as braising and simmering. New ways of roasting and cooking meats have appeared with the advent of new ovens. The microwave oven, for example, can cut roasting time from half to a tenth of that required by conventional methods. Infrared quartz lamps give excellent though not quite so fast results in the cooking of hams, roasts, and meat as from broiling. Because tenderness in meat is still the concern of the meat producer, the packer, and the quantity food operator, much research continues to be done on effective tenderizers. Papain is used today in this connection.

Buyer's Guide. Successful food purchasing depends on know-how or facts about food. The first line of control in buying is the menu, which automatically limits and dictates the food order. For this reason the menu should be planned to take into account the popularity of each item featured, its availability, and its cost in relation to selling price. The cost of each item on the menu must be known. The type of operation will determine quality. To buy successfully, certain other things must be known: yields in terms of pounds, bushels, bags, boxes, and so on; a sales forecast should be used; and, the buyer should also have a sales analysis of commodities purchased in the past. Armed with these preliminary weapons, the actual purchasing begins. The buyer should then follow these rules: Buy by specification, grade, and weight. Compare yields from different grades. Specify minimum weights and buy the best quality suited to the use. Buy only the amount that can be stored properly and used to advantage, and buy on a bid, or competitive basis. All buying should be kept on a professional basis and salesmen interviewed in the buyer's office.

Buying Poultry. Brand names are guides for the quality of poultry. The government inspection mark in the form of a circle refers only to the bird's fitness for food. Government grades appear only on poultry that has been processed in an approved plant. Some poultry is not inspected, and when the buyer makes his purchases he must rely on specific characteristics of identification, such as size; texture and thickness of skin; firmness of the flesh; distribution of the fat; and flexibility of the breastbone. Poultry may be bought packaged to meet every need—dry packed, ice packed, or frozen. It is not difficult to estimate the amount of smaller birds that will be required to meet needs, but when buying larger birds a yield chart should be used. If a combination of turkey sizes is used, each weight class must be estimated separately and the results added. Types of poultry on the market today include: broiler or frying chicken, roasters, capons, stewing chicken, squab, Rock Cornish hens, fryer-roaster turkeys, young hen turkeys, young tom turkeys, hen turkeys, tom turkeys, broil-fry-or-roast ducks, young or mature geese, young or mature guineas.

Buying Eggs. Shell eggs are available in different federal grades designated by the letters AA, A, B, and C. Many fine graded eggs are sold under a brand name or trademark. Only AA or A quality eggs should be used in egg dishes. For other cooking, lower quality eggs may be used. Eggs are purchased by weight per crate according to the size of the egg—but size does not always indicate quality. Specifications carrying the grade, size, weight, and color should be set up. Check and weigh all purchases when received. There is no difference between brown and white eggs. Frozen eggs are used extensively in bakery departments and are available in 30-lb. tins as whole eggs, egg yolks, and egg whites. Frozen eggs are usually cheaper than shell eggs and are used in place of equal weights of fresh, whole eggs, egg yolks, or egg whites. Egg solids or dried eggs are used by commercial manufacturers and not in any large measure in quantity food operations. They are available as whole egg solids, egg yolk solids, and egg white solids and are generally less expensive than shell or frozen eggs. They have the same nutritive properties.

Purchasing Fish. Because fish is a delicate and perishable food as well as an excellent media for the growth of bacteria, only the best should be bought and bargains not considered. Once purchased, fish must be kept refrigerated at all times. The market forms of fish are: whole or round, drawn, dressed or pan-dressed, steaks, single fillets, butterfly fillets, and fish sticks. The single fillet is most commonly used over the butterfly fillet. Fish steaks are usually cut ¾ to 1 in. thick. Sticks are cut lengthwise or crosswise from fillets or steaks into portions of uniform length, width, and weight. Freshly purchased fish should have bright eyes, full and never sunken; the gills should be reddish pink, free from slime and odor; the scales should be bright, shiny, and adhering tightly to the skin; the flesh should be moist, firm, elastic, and not separating from the bone. Defrost frozen fish in the refrigerator at temperatures from 40° to 45°F. or in the case of whole or drawn fish, thaw by immersing in

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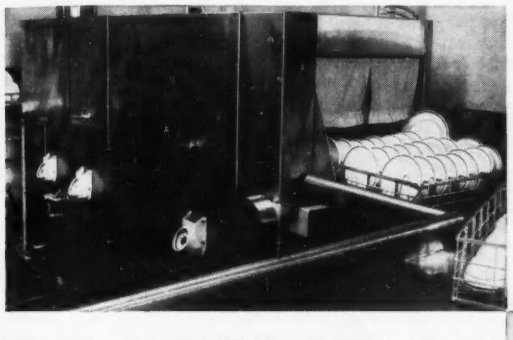

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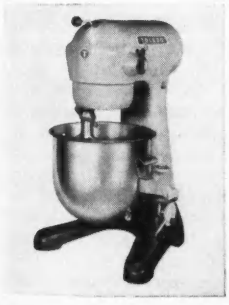

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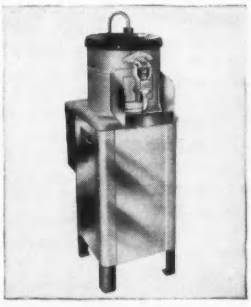

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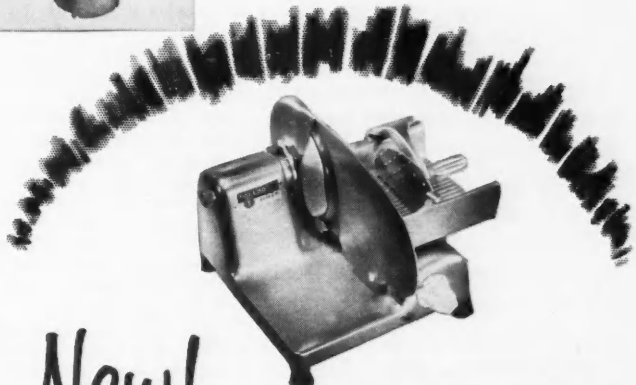

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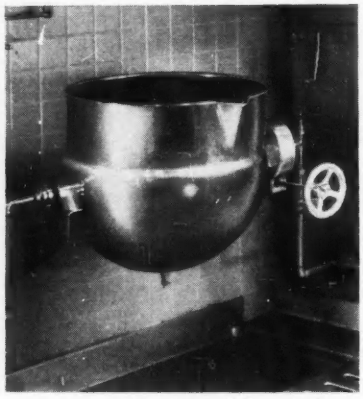

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cold running water. Once defrosted, frozen fish should never be refrozen. Information on specific fish covered in this article includes descriptions of: halibut, pompano, red snappers, cod, flounders, haddock, mackerel, shad, shad roe, roe of other marketed fish, swordfish, whitefish, chubs, salmon, chinook or king salmon, red or sockeye salmon, medium red salmon, pink salmon, shrimp, breaded frozen shrimp, live lobsters, rock lobsters, spiny lobsters, crawfish, lobster tails, crabs, scallops, clams, and canned clams.

Buying Fresh Fruit. Grading by the U.S.D.A. of fresh fruits and vegetables is done according to specifications laid down for each variety, but for top grades these criteria are held in common: fruit or vegetable must be free from decay or injury by damage or disease; well-formed, mature but not over-ripe; and usually the same varietal characteristics for all fruit or vegetables in the container. The tolerance for defects increases with each lower grade. There are many well-tested rules to follow in purchasing. Buy quality products that will best suit the particular purpose for which they are to be used. Buy when the fruit is plentiful. Remember that "bargain" produce may often carry more waste and will be more expensive in the long run. Distinguish between the damage that will detract from appearance and eating pleasure and the damage that will involve time, labor, and waste in preparation. Always buy by specifications, by weight if possible, and specify count or size. Remember that the medium size of many fruits is the most economical for all-purpose use. Know the type of containers in which fruit is marketed and their correct commercial terms so that the specifications will be accurate. In addition, know the style of packing and the fill of the container in order to estimate the total requirement. Make yield tests frequently, studying the yield from the unit of purchase. Go to the market in person whenever possible. Compare prices and grades of similar fruit items from at least two vendors. Keep informed of what's available by studying the carlot loadings, track holdings, unloads, diversions, and amounts of produce stored. This information can be found in U.S.D.A. reports and in local newspapers. Descriptions and data on the following fruits are included in this article: apples, apricots, avocados, bananas, citrus fruits, grapes, peaches, pears, pineapples, plums and prunes, and melons.

Buying Canned Foods. Specifications for processed foods may include the following factors: grades wanted, type, geographical area, count size, sirup density, specific gravity, size and kind of container, drained weight, and (optional) the code number or markings on the can. In grading canned goods, a degree of tolerance amounting to 10 points is allowed. Therefore, fancy grades may rate from 90 to 100 and manufacturers sometimes take cognizance of this by supplying labels of different design for the designation of quality or grades within the specific grade. Top quality within each grade means, of course, a "plus" purchase value, and this factor should be taken into account when pretesting canned products of the same grade. Pretesting is recommended as insurance and as a method that pays off in buyer and eventual customer satisfaction. Whether the buyer uses the open-purchasing-marketing, competitive formal, or informal bid buying methods, there are six important steps he should take in making his selections: (a) spot purchase of available floor stocks for quick shipment in one delivery; (b) spot contract purchase of readily available stocks on contract basis for shipment at stated intervals; (c) future delivery purchase of stocks at firm prices to be shipped in one delivery when packed at some future date; (d) future contract purchase of stocks at firm prices to be shipped at stated intervals; (e) S.A.P. (soon as possible) purchase of stocks to be shipped in one delivery when packed at some future date subject to approval of price when named; and (f) S.A.P. contract purchase of stocks to be shipped at stated intervals or as needed over a specified period when packed at some future date subject to approval of price when named. Detailed information is given in this article on canned meats and poultry and on the grading of canned fish products.

Ordering Frozen Foods. Frozen fruit for quantity food operations is usually packed in lacquered tins with slip-cover tops, ranging in weight from 5 to 50 lb., the most popular size being 30 lb. Vegetables are marketed in rectangular paperboard containers containing 2½, 5, or 10 lb. A satisfactory temperature for storage is 0°F., but specifically corn, snap beans, and mushrooms should be stored at −5°F. or lower. The lower the temperature, the longer any frozen fruit or vegetable can be stored. The U.S.D.A. has set up standards for many frozen fruits and vegetables, but their use is optional as the packer may establish his own. Factors influencing the quality of frozen fruits and vegetables include the variety of the product, the storage temperature and humidity, and product changes during the freezing processes. It was noted that some fruits are packed with sugar and others, known as dry pack, are just washed and frozen. Sugar content of frozen fruit is indicated by the figures "3 plus 1," "4 plus 1," and "5 plus 1," designating that there are 3 parts fruit to 1 of sugar, and so on.

Vegetable Buying. The buying techniques outlined in the article on fruit purchasing are assumed to apply

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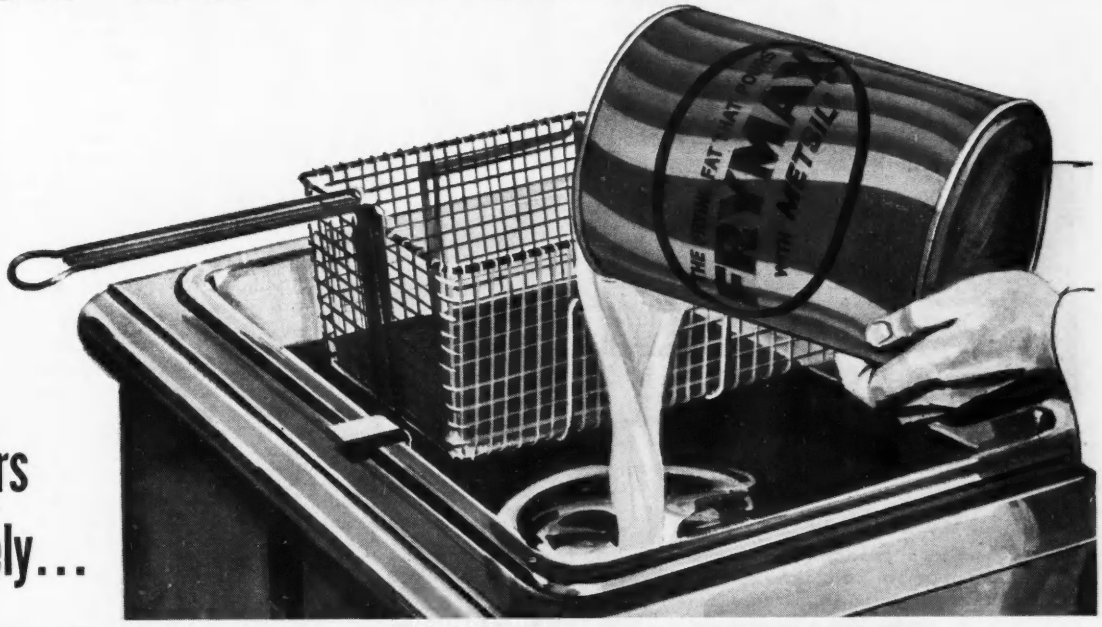

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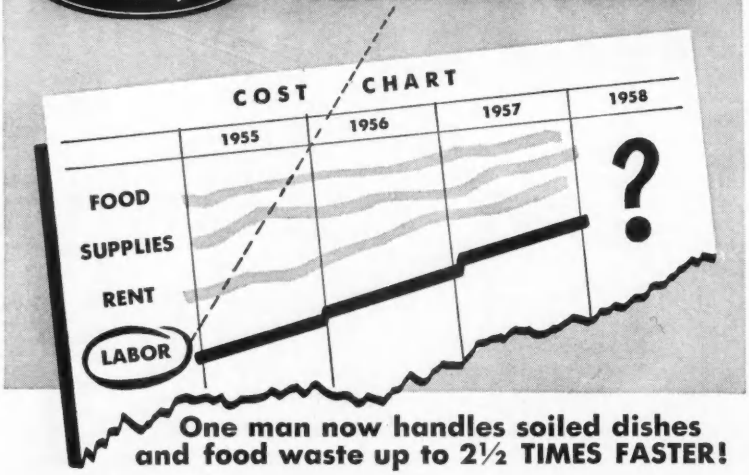

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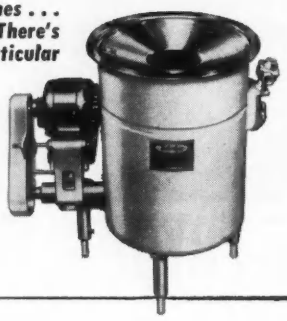

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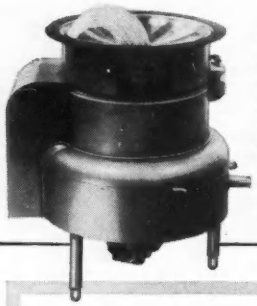

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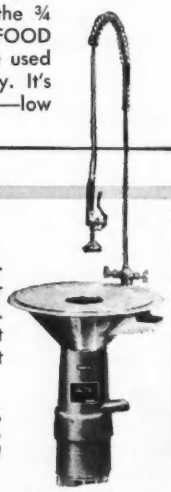

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Combination non-clogging, shredder-type disposer with overhead spray and patented silver salvage basin. Select ¾ or ½-h.p. grinder. Silver Salvage Basin can be removed and unit performs as grinder only. Efficient, low-cost scrapping, pre-washing and disposing.

SALVAJOR has the answer to every soiled dish and food waste problem — write today for full details!

Salvajor

7235 Central • Kansas City, Missouri

here. The specific vegetables on which detailed information is given are: artichokes, asparagus, Lima beans, snap beans, beets, broccoli, Brussels sprouts, cabbage, cauliflower, carrots, celery, corn, cucumbers, eggplant, lettuce, onions, parsnips, peas, peppers, potatoes, sweet potatoes, spinach, squash, tomatoes, and turnips.

Efficient Mobility. Special precautions should be taken in utilization of carts and racks not to overdesign or overpurchase for the very many applications of wheels to everything from the receiving room to the pot-washing area. Buy standard equipment whenever possible and judge each purchase by these criteria: Will it make space available for other purposes? Will it save an employee's back and feet? Will it promote a more sanitary and easily cleaned operation? All wheeled devices require adequate aisle space with good turn radii at the corners, and the entrances to serving areas, doors on refrigerators, storerooms, and so on, become important with the operation of this type of equipment. Be sure the refrigerator is designed to receive wheeled trucks and that the floor is level with the kitchen floor. Where, in certain areas, the floor is depressed, be sure to use wooden floor racks to offset them. If carts are used in the dining area, dining spaces must be carefully analyzed with passageways and aisles of proper width to allow for the carts. The importance of determining in the preliminary stages of a design problem, the extent and type of portable equipment that will be used in the ultimate finished food service operation cannot be overemphasized. A run-down on types of wheeled equipment and their uses appears with this article.

THE MODERN HOSPITAL

Vol. 90, January, 1958
*Punch cards simplify selective menus. W. Lowder and C. Medill.—p. 102.

Punch Card Menu System. A punch card installation on which selective menus and therapeutic diets are coded speeds service to patients and enables the kitchen staff of Memorial Hospital, Wilmington, Delaware, to plan meals so accurately that wasted leftovers are eliminated. The key to the success of this operation is found in a well designed card on which appears the menu along with necessary coding information for machine counting and sorting. Selective menus are circulated one day in advance, and menu clerks, using diet requests received from each nursing floor, prepare a set of three punch cards. Shortly after breakfast these cards are taken to the floors where patients mark them with special pencils. Once returned to the food service office, the cards are checked to see that they have been properly marked and they are separated into stacks for breakfast, lunch, and dinner. Then, about twenty blank cards for general house diets

Another Food Value FIRST

Turkey

Lowest in Cholesterol

Dr. M. L. Scott

Turkey scores again! To the unrivaled rating turkey meat already holds for its "highest-in-protein, low-fat content," comes now another highest honor. Of all meats, turkey ranks lowest in cholesterol. Its fat content, already rated as low, now is classified as "soft" or vegetable-type fats — the kinds which do not increase the blood cholesterol level. These findings are just reported by Cornell University. They are significant, since medical research, in the words of Dr. M. L. Scott, nutritionist of Cornell under whose direction the studies were made, "has shown that most persons suffering from coronary heart disease exhibit an elevated level of cholesterol in the blood."

Other recent nutritional findings as reviewed by Dr. Scott indicate:

- *that in most cases of coronary heart disease the blood cholesterol levels have been shown to be higher than normal;*
- *that reducing the fat content of the diet to a very low level results in a lowering of the blood cholesterol;*
- *that under certain experimental conditions the addition to the diet of fats containing a high portion of saturated fats causes a prompt and marked rise in blood cholesterol;*
- *that, when blood cholesterol is high, it can be reduced under certain experimental conditions with the ingestion of certain unsaturated fats (turkey fats are high in unsaturated fatty acids and essential fatty acids).*

Previous studies show that turkey meat is:

- *highest in protein and high in riboflavin and niacin.*

Judged by all these factors, no other meat can compare with turkey in all these desirable food values.

For the complete story of turkey and its food values, write for free booklet, "Turkey, the Meat that Meets Highest Nutritional Standards."

NATIONAL TURKEY FEDERATION
Mount Morris, Illinois

Please send booklet, "Turkey, the Meat that Meets Highest Nutritional Standards."

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are added to cover diet changes, new admissions, and guest trays during the following 24 hr. The cards are then machine processed and punched automatically by the reproducing punch at the rate of 100 cards per minute. Then they are fed into a sorter that processes 400 cards per column per minute. In this way, a total count for each food item is obtained in 10 min. for all three meals. The chef, range, pantry unit, and food service manager receive copies of this count. After the first count, the breakfast, lunch, and dinner cards are fed back into the sorter and the cards are sorted into the order for meal serving for patients on each floor. The cards for all meals, in the order in which the patient is to receive his tray, are grouped together in this process and then the three menus belonging to each patient are placed in a visual master card holder with the patient's diet order. Changes can be made immediately if they are ordered. A last-minute count on therapeutic and regular diets is taken just before the food service line is ready to serve, and final adjustments in food preparation are made at this time. Cards are again put through the machine and come out in proper serving order; then they are compared against master card holders before going to the food service line where they are used in assembling the trays.

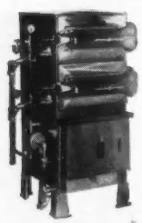
NOW...
PUT STEAM TO WORK!
STEAM COOKING IS REALLY A MUST

THOUSANDS of eating establishments depend on steam cooking. MILLIONS of people eat steam-cooked foods every day. Steaming has so many convincing advantages that few operators can afford to be without it . . . *Can You?*

•

Steaming results in cooked foods that are juicy, have natural flavor and appearance . . . with important nutrients retained. Steaming facilitates frequent small-lot cooking to provide freshly cooked food for every serving. Foods are never burned . . . left-overs are minimized. Steaming saves handling and scouring of many pots and pans.

Steaming prepares foods Better•Easier•Faster



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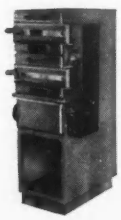
You can take full advantage of Steam-Cooking with
STEAM-CRAFT
and
STEAM-CHEF Steamers



THE CLEVELAND RANGE COMPANY
3333-L Lakeside Avenue • Cleveland, Ohio

RESTAURANT MANAGEMENT

Vol. 81, December, 1957

*Psychological tests. H. H. Pope.—p. 34.
*It can't happen here.—p. 38.
*Kitchen cues. A. Eiss and G. Eiss.—p. 66.

Tests. Experience with psychologic testing in one chain of cafeterias has indicated that certain tests can be helpful in selection, placement, and advancement of employees. This particular program showed that although the interview is still the basic tool in deciding on advancement, the use of an intelligence test and a hand-eye coordination test is a valuable help to the interviewer. The tests pointed up the fact that it is almost impossible to hold intelligent people on a permanent basis unless they are given challenges. Where tasks are repetitious, there is a tendency for less intelligent people to be attracted to the job. When setting up a program of psychologic testing, it is advisable to use the services of a professional psychologist. No one should be employed as a manager without first being given, by a professional psychologist, a complete battery of tests.

It Can't Happen Here. In a Houston restaurant an individual system of service has grown up that virtually eliminates customer complaints. The proprietor of the restaurant, which serves a specialty menu of only seven entrées, mostly steaks, with salad potatoes, and French bread, describes the system as a combination of the finest French restaurant and the hash house. This is because the service is both fast and extremely complete. Waitresses are trained and supervised closely for one month in the art of cooperation with the kitchen and management. Because the chefs and the kitchen are in full view of the diners, no friction can be tolerated, and all orders must be completely understood. The kitchen backs up the waitresses completely: if a customer complains that a steak is tough or overdone, the waitress immediately replaces it, picking up another entrée, even breaking into another order if necessary. There are no stations in this restaurant, and the waitresses pool their tips. Girls are required to take turns doing things: serving salads, pouring coffee, or taking orders. Orders are written so that any girl can pick up whatever is ready on the open hearth and serve it correctly to those seated at the table without asking who has what coming. The girls pitch in to help each other at all times. Conferences are held two or three times a week before the restaurant opens, with the cooks sometimes sitting in. Patient management and staff cooperation have produced superlative service that eliminates complaints and boosts business.

Kitchen Cues. A complete file of tips on cleaning floors and protecting them from wear and tear is to be found here. Techniques of mopping, waxing and polishing are given for linoleum and rubber, asphalt and vinyl tile.

You get the most from Monarch

First across the Nation . . . because of Quality - Service - Variety - Price

QUALITY—MONARCH maintains its 105 year old reputation for finer foods, with rigid quality controls, checked at each of MONARCH's 30 processing plants . . . re-checked by laboratory sampling prior to distribution.

SERVICE—To insure prompt and accurate deliveries, MONARCH maintains 22 distribution warehouses of its own, plus a national network of special institutional distributors.

VARIETY—You can choose from more than 500 items when you order MONARCH FOODS. Our institutional salesmen can now handle almost all your food needs in just one call.

PRICE—You get real value. In spite of their unexcelled quality and solid packing, nationally known, quality controlled MONARCH FOODS cost no more than ordinary brands.

For the full MONARCH story, write, wire or phone us today.

MONARCH FOODS, Canners and Processors, INSTITUTIONAL PRODUCTS DIVISION
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Monarch for over a Century... the King of finer foods

The care of cement floors, including the treatment for an unsealed floor, is described. Terrazzo, marble, and ceramic tile floors come in for some attention, too. The treatment of wood floors and the solution of special floor problems are discussed.

PERSONNEL JOURNAL

Vol. 36, December, 1957

*Six pointers to more useful attitude surveys. L. E. Albright.—p. 254.

Vol. 36, January, 1958

*The executive changes his job. R. Hershey. —p. 295.

Tips on Attitude Surveys. In taking an attitude survey, don't assume that you know the minds of your employees. Base questionnaires on a sampling of employee interviews rather than on your own opinions. Beware of the package survey, which although standardized, is often far too general to be of use in a specific organization or situation. Plan in advance to use a scaling procedure that yields meaningful results, such as a Likert-type scale which computes the total morale score of the employee as well as scores on each aspect of the job situation. Pre-test the questionnaire to ferret out ambiguous questions and refine the scale statistically. Consider the use of an outsider to administer the scale, and protect the anonymity of the workers. After completion of the survey, compare results with previously known surface indicators, such as rates of turnover, absenteeism, and grievances. These recorded facts can provide external evidence of the validity of the scale.

Changing Jobs. Here are ten points an executive considering a change in jobs should study about the new situation before making a final move.

WHAT'S NEW IN HOME ECONOMICS

Vol. 22, January, 1958

*How to choose the dairy foods to use.—p. 60.

*How to choose the diet foods to use.—p. 61.

Choosing Dairy Foods. On the market today are such a number of milk products that the homemaker has virtually a whole world from which to choose. Among the products which require refrigeration are fresh whole or skim milk, natural or cultured buttermilk, light coffee cream, heavy whipping cream, half and half, and cultured sour cream. Evaporated milk, sweetened condensed milk, dried whole milk, dried nonfat milk, malted milk, and concentrated fresh milk as well as powdered cream do not require refrigeration. The fresh milk and cream products are most often pasteurized, frequently homogenized, and come in a variety of bottles or cartons. Other milk products can be purchased in cans, jars, and packages. The homemaker chooses cheese according to many classifications, one of which is texture. Very hard cheeses include Parmesan, Romano, and Sapsago. Hard cheeses include Cheddar, Swiss, Gruyere, Stilton, and so on. Examples of semi-soft cheeses include brick, Muenster, and Monterey jack. Available soft cheeses include Bel Paese, Camembert, cottage, and cream. In addition to the regular cheeses, there are specialty cheeses. Available butter products include lightly salted, unsalted, and whipped butters. These are packaged in ¼-lb. prints, pound prints, and are sometimes sold in bulk. Whipped butter is only sold in ½-lb. cartons. Frozen desserts complete this list of products. These include ice cream, ice milk, sherbet, water ice, and mousse.

Choosing Diet Foods. There are many everyday foods which can help make a weight-reducing or therapeutic diet palatable. These include cottage cheese and skim milk, lemon juice, lean meat and poultry, fresh fruits and vegetables, and many spices and herbs. Diet-pack fruits, juices, and vegetables are also a boon to those who want to lose pounds and today they so closely resemble the normal pack foods that the addition of a little sugar, in the case of fruits, is all that is necessary to make their serving acceptable to the whole family. Some of the specially packed diet foods are: sea foods and chicken that can be chosen when a convenience food is needed; low-sodium, Cheddar-type cheese, beverages, soups, dressings, seasonings, relishes, sweeteners, sirups, spreads, desserts, sweets, and cereal products.

For the best solution to every TOAST problem...

There's no substitute for Savory

Fast, convenient and dependable toasting during busy meal times is the answer to a serious problem—in hospitals, schools and institutions.

Undersized or inadequate toasting equipment creates service delays and appetite appeal may be destroyed unless toast is served crisp, fresh and hot.

Savory automatic conveyor type toasters provide the greatest toast production possible—6 to 12 slices per minute—and perfect golden brown toast every time.

Ask your Kitchen Equipment Dealer to show you how Savory can speed up food service and provide greater economies, or write:

Savory EQUIPMENT, INCORPORATED
120 Pacific St., Newark, N. J.

ONE CONVEYOR...MANY TOP ARRANGEMENTS

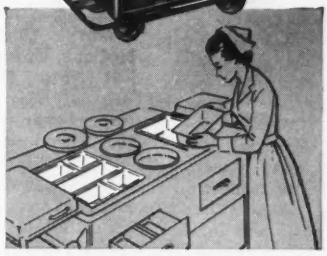
All-purpose food conveyor provides interchangeable insets for various menus

• You are ready for every food service requirement with Blickman-Built all-purpose food conveyors. Simply arrange the different sizes of square and rectangular insets in the top deck to suit the menu. For general service, you store the relatively limited variety of foods in larger insets. To handle the more diversified foods in selective menus and special diets, you replace the larger insets with a greater number of smaller ones. Round wells are also provided for soup, broth and potatoes.

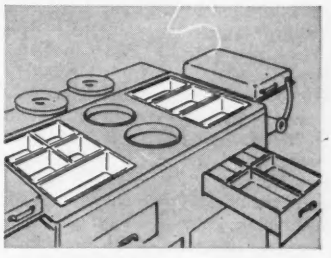
• Seamless top and crevice-free body is standard construction in all Blickman-Built stainless steel food conveyers. These features offer notable benefits in sanitation and durability.

• The new Hi-Flo heating system cuts preheating time in half, assures piping hot foods for your patients.

A full complement of square and rectangular insets provides food storage for a wide variety of menus.



Rectangular wells accommodate a variety of inset combinations.



Another possible arrangement for top deck. Heated drawer holds special diet insets. Round insets are for soup, broth or potatoes.

Another variation showing use of one full-size pan at left and four insets in right-hand well.

All-Purpose Model ALS-4922
Long shelf and two rectangular pan covers provide work surface for loading trays.

SEND FOR CATALOG
Blickman-Built all-purpose food conveyors are fully described in our new Catalog T-5. Also shown are a wide selection of bulk food and tray conveyors designed for various types of decentralized and centralized services. Write for your copy today.

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BLICKMAN
FOOD SERVICE EQUIPMENT

Army Graduate Education Program. A new program to assist and encourage dietitians to participate in graduate-level professional training has been announced by the Department of the Army. Under this plan, a dietitian who is accepted or matriculated in a graduate school of her choice for work leading to the master's degree in foods and nutrition or institution management may be appointed as a reserve commissioned officer of Army Medical Specialist Corps in the grade of Second or First Lieutenant. The student, during the year she is pursuing her studies, will receive full pay and allowances for officers of her grade ($4062.96 to $4612). Completion of a dietetic internship is a prerequisite for commissioning and the grade in which the student is appointed will be determined by the length of professional experience. Payment of tuition and other fees incident to this education is the responsibility of the individual. On completion of the educational program, the dietitian will join the Food Service Division staff of an Army hospital for two years.

Further information about the program may be obtained from the AMSC Procurement Officer in the various regional Army headquarters or The Surgeon General, Department of the Army, Washington 25, D.C., Attention: Chief, Personnel Division.

Miss Jones Receives McLester Award. Edith A. Jones, Chief, Nutrition Department, The Clinical Center, National Institutes of Health, Bethesda, Maryland, on October 30 became the fourth recipient of the McLester Award of the Association of Military Surgeons of the United States. The award, established in 1954 by the J. B. Roerig Company Division, Charles Pfizer and Company, Inc., is presented annually to the person who is, or has been, at any time a commissioned officer or of relative status in the federal medical services and who has done outstanding work in the field of nutrition and dietetics. The award consists of a bronze plaque and an honorarium of $500. It is named to honor Col. James Somerville McLester, MC, USAR, of Birmingham, Alabama, who served as consultant to the Surgeon of the American Expeditionary Forces in World War I. He was recognized for his outstanding achievements in the field of nutrition.

Continuing Education Program for Dietitians. Kansas City, Missouri, was the scene of a special program of continuing education for dietitians sponsored by the Catholic Hospital Association, February 5 to 9. The program was divided into sessions on the following topics: personal development, organization of the department, teaching responsibilities, normal and therapeutic nutrition, and the future. Specific presentations included:

"Evaluating and Maintaining Professional Status"—Charles E. Berry, Catholic Hospital Association

"Dietary Service—A Vital Part of Professional Care"—Sr. Jeannette Marie, Good Samaritan Hospital, Cincinnati

"Formulation of Regulations for the Dietary Department" — Elizabeth McCune, University of Kansas Medical Center, Kansas City, Kansas

"Tools of Management in Methods Improvement"—Ned Eddy, Kansas City, Missouri

"Employee Participation in the In-Service Program"—Rosemary L. Lodde, Formerly Dietetic Specialist in Training, Veterans Administration, Washington, D.C.

"The Dietitian's Role as a Public Health Agent"—Evelyn Carter, Missouri Division of Health, Jefferson City

"Nutrition Education Made Practical for the Medical Intern"—Marguerite Pettee, University of Colorado Medical Center, Denver

"The Student Nurse Applies Her Knowledge of Nutrition"—Arlene Payne, University of Kansas Medical Center

"Menu Planning—Some Tricks of the Trade"—Sr. M. Brigid, St. Vincent's Charity Hospital, Cleveland

"Newer Trends in Therapeutic Management"—Albert I. Deckerm, M.D., Kansas City, Missouri

"Better Results in Food Service Through Time Studies"—Harry H. Pope, Pope's Cafeterias, St. Louis

"Maintaining Consistency with Food Control"—Lenore M. Sullivan, Iowa State College, Ames

"New Equipment—Infra-Red Heating, Electronic Ovens, Radar"—A. A. Mesko, Hotpoint Company, Kansas City, Kansas

"New Food Products" — Gertrude Kable, Ralston Purina Company, St. Louis

"New Dairy Products" — Marie C. Harrington, Dairy Council of St. Louis

"Disaster Planning for Dietary Departments" — Maj. Katharine E. Manchester, Brooke Army Hospital, Ft. Sam Houston, Texas

"Modern Sanitation Methods"—James E. Woodruff, U.S. Public Health Service, Kansas City, Missouri

Conferences. February 28 and March 1 were the dates of the *Fourth Bi-Annual Conference on Human Nutrition* held on *The Ohio State University campus*, Columbus. The program on the first day emphasized newer knowledge of nutrition, while the second day was devoted to the problems of putting knowledge into practice through nutrition education, especially in the elementary grades. Among the speakers were: Drs. Gilbert Forbes, Helen Hunscher, Ruth Leverton, Fredrick J. Stare, and Charlotte M. Young. The conference was presented by the Ohio Nutrition Committee and sponsored by: the Institute of Nutrition and Food Technology, College of Education, and the Graduate School of The Ohio State University; Ohio Departments of Education and Health; and Ross Laboratories, Columbus.

Wayne State University College of Medicine, Detroit, will sponsor a fourth *Annual Nutrition Conference* on April 24 and 25. Speakers on the general theme of "Proteins and Amino Acids in Nutrition" will include: Dr. F. E. Deatherage, The Ohio State University; Dr. C. A. Elvehjem, University of Wisconsin; Dr. E. E. Rice, Research Laboratories, Swift and Company; and Dr. N. S. Scrimshaw, Institute of Nutrition of Central America and Panama, Guatemala City. Dietitians are invited to attend.

The U.S.D.A. lists the following foods expected to be in plentiful supply in March:

Protein foods
Dairy products
Eggs
Peanuts and peanut products
Pork
Turkeys

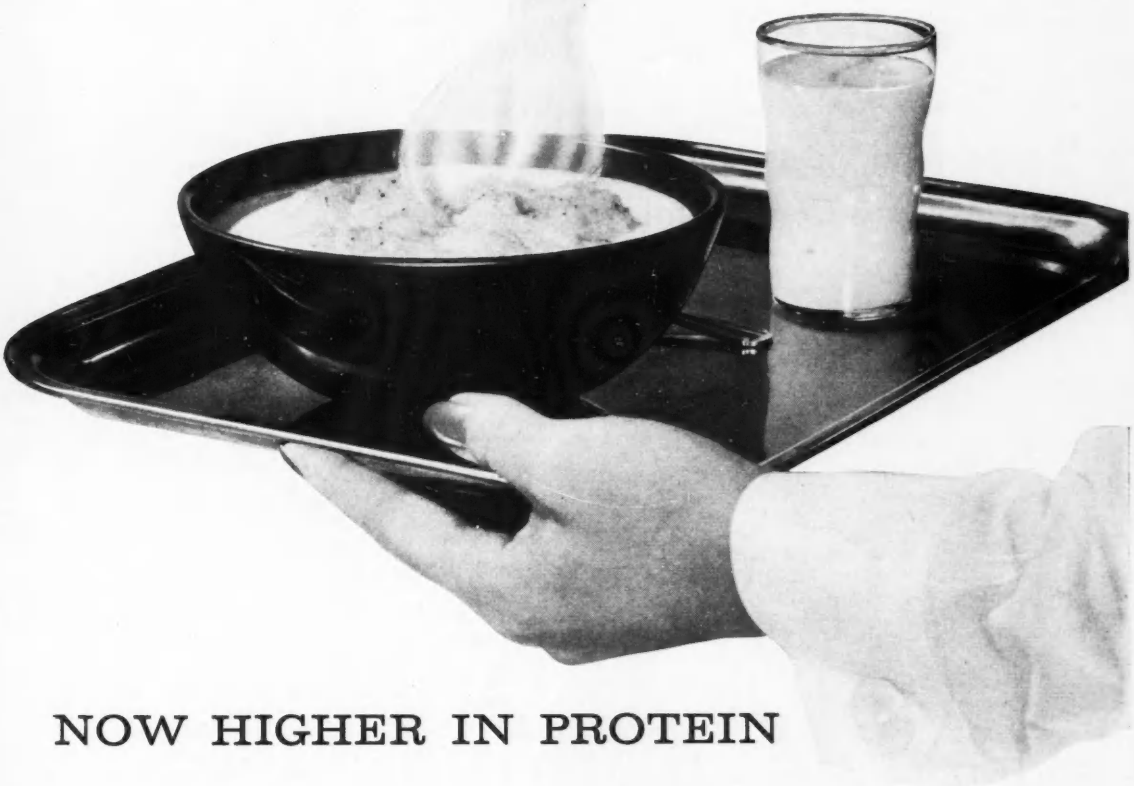
Other foods
Apples
Corn, canned and frozen
Pears, canned
Prunes

Pesticide Residues in Milk. On January 17, the Commissioner of Food and Drugs issued a regulation setting a zero tolerance for methoxychlor in milk. This in effect outlaws methods now in use for applying the pesticide to cows to keep them free from flies. Use of methoxychlor in ways which do not result in residues in the milk is not affected by the action. This regulation came as a result of the work of a committee of the National Academy of Sciences under the chairmanship of Dr. Herbert E. Longenecker, Vice-President, University of Illinois, which was established at the request of the Food and Drug Administration to study the problem of pesticide residues in milk. The committee found that data on safety were inadequate to justify establishing a tolerance which would permit residues of methoxychlor in milk.

The committee pointed to the long-standing policy of the Food and Drug Administration and state food officials that no poisonous or deleterious substance should be sanctioned in milk. In view of the importance of milk in the diet, the committee recommended

NEW INSTANT Malt-o-Meal

SPARKS UP DREARY DIETS!



NOW HIGHER IN PROTEIN

Delightfully "Different" Flavor! Wonderful combination of sunny wheat and toasted malt appeals to young and old . . . perks up lagging appetites . . . relieves the monotony of restricted diets.

Rich in Food Energy! Fortified with B complex vitamins and iron.

Highly Digestible! Smooth and bland . . . free from irritating fiber.

Cooks Instantly! Just add Instant Malt-o-Meal to boiling water, remove from heat, let stand—serve when desired. (*No sodium added* to make it quick-cooking.)

JUST WHAT THE DOCTOR ORDERED TO BRIGHTEN UP DULL DIETS

FREE!

MALT-O-MEAL COMPANY
1212 Foshay Tower, Minneapolis 2, Minn.

Please send me, without cost or obligation, a full size package of New Instant Malt-o-Meal Wheat Cereal.

Name_____ Position_____

Organization_____

Street_____

City_____ Zone____ State_____

a greater margin of safety must be established in fixing a tolerance than would be the case for any other food item in the human diet.

FAO Reports. From the Food and Agriculture Organization of the United Nations have come two new reports. The first, *Calorie Requirements,* is FAO Nutritional Studies No. 15 and is a report of the Second Committee on Calorie Requirements. In this publication, the first report (1950) of the Committee on Calorie Requirements is revised and extended. The requirements of children have been re-assessed and the methods of allowing for the influence of age and climate on requirements have been modified. Greater attention has been given to the problem of the relationship between activity and requirements. In general, the new recommendations, when applied to large populations, result in a level about 4 per cent higher than figures estimated according to the earlier recommendations. Throughout, the Committee has considered requirements at the physiologic level, and figures put forward relate to food as consumed. Separate chapters of the report deal with: the reference man and woman; the effect on calorie requirements of: activity, body size, aging, and climate; the requirements of children; the contribution of alcohol to caloric intake; and application of the recommended system and figures. Copies may be ordered at 75 cents each from: International Document Service, Columbia University Press, 2960 Broadway, New York 27.

Also from FAO comes *Protein Requirements,* which carries the number, FAO Nutritional Studies No. 16. After a brief reference to previous efforts to define protein requirements, this report discusses the problem of definition of requirements, and then presents "average minimum requirements for the reference protein." The reference protein is one of high nutritive value, defined by putting forward examples of proteins which fall into this category: milk, eggs, and meat. The average minimum requirements are those needed for nitrogen equilibrium in healthy adults; for children, they represent the average minimum needs compatible with a rate of growth characteristic of a representative, well fed group of children. The recommendations for different age groups are presented in terms of grams per kilogram body weight, ranging downward from 2.0 gm. for infants to 0.35 gm. for adults. The chapters following the recommendations present a "provisional 'amino acid pattern'" and consider the practical application of these proposals. Copies of this report may be ordered from the International Documents Service, Columbia University Press, New York 27, for 75 cents each.

Report on Amino Acids. *Amino Acid Content of Foods* is the title of Home Economics Research Report No. 4, newest publication of the Home Economics Research Division, Institute of Home Economics, U.S.D.A. Written by M. L. Orr and B. K. Watt, data for the eighteen most frequently occurring amino acids in foods are presented in two tables. Figures in both tables are tabulated according to eight food groups: milk, milk products; eggs; chicken; meat, poultry, fish and shell fish, their products; legumes (dry seed), common nuts, other nuts and dry seeds, their products; grains and their products; fruits; vegetables; and miscellaneous food items. The first table gives average, maximum, and minimum amino acid values in grams per gram total nitrogen in the edible portion of some two hundred foods. The second table presents averages in grams per 100 gm. edible portion for a limited number of foods. These calculations were done from the average values in the first table, using factors for protein content published by Jones for different kinds of proteins. The data in Table 2 are included to provide figures that may be used directly to estimate amino acid content of foods of average protein content.

Most of the data used in this publication are based on work reported since 1945, with nearly half since 1950. Sources of the data and cited references are presented in a seventeen-page bibliography.

Single copies of this report may be

"Never mind the smelling salts, what he needs is Continental Coffee!"

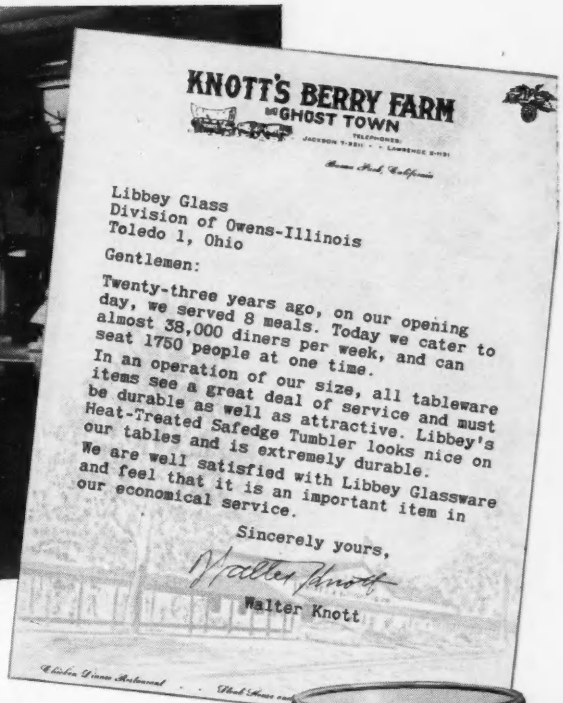
Write for free trial package

Continental Coffee

AMERICA'S LEADING COFFEE
for Restaurants, Hotels and Institutions
CHICAGO • BROOKLYN • TOLEDO • SEATTLE

Libbey Heat-Treated Safedge Glassware "is an important item in our economical service"

The Steak House, one of the four large dining rooms at Knott's Berry Farm.



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GHOST TOWN

Buena Park, California

Libbey Glass
Division of Owens-Illinois
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Gentlemen:

Twenty-three years ago, on our opening day, we served 8 meals. Today we cater to almost 38,000 diners per week, and can seat 1750 people at one time.

In an operation of our size, all tableware items see a great deal of service and must be durable as well as attractive. Libbey's Heat-Treated Safedge Tumbler looks nice on our tables and is extremely durable.

We are well satisfied with Libbey Glassware and feel that it is an important item in our economical service.

Sincerely yours,

Walter Knott

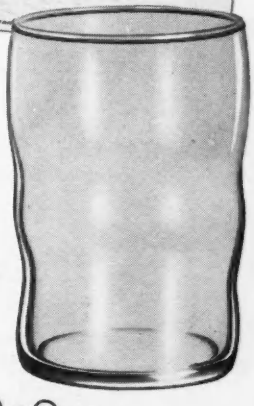
Walter Knott

Located 22 miles from Los Angeles, Knott's Berry Farm is one of the largest and most popular eating places in the Southwest. There are restaurant facilities for 1750 people, 33 intriguing shops, a Ghost Town, Gold Mine, and many reminders of early life in Southern California.

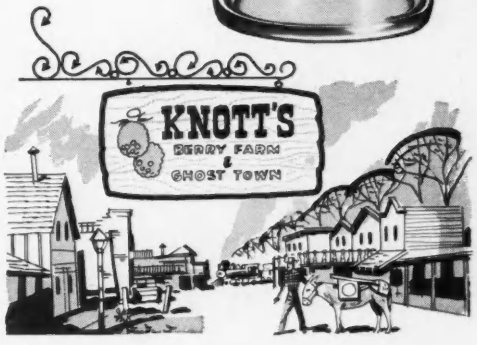
Libbey Heat-Treated Safedge Glassware provides complete water service in all four dining rooms at Knott's Berry Farm. The pleasing appearance of the glassware, and its extreme durability contribute towards the successful operation and development of this famous eating place.

For every operation, whether large or small, Libbey Heat-Treated Glassware provides attractive, durable and economical service. Audit checks made in seven leading restaurants showed the average number of servings per tumbler ranged from 739 to 3700, at a per thousand serving cost of 8.8 and 1.8 cents respectively. And every glass is backed by the famous Libbey guarantee: "A new glass if the rim of a Libbey 'Safedge' glass ever chips."

Learn how Libbey Heat-Treated Safedge Glassware can help reduce your own operating costs. See your Libbey Supply Dealer, or write to Libbey Glass, Division of Owens-Illinois, Toledo 1, Ohio.



Water Tumbler
HT No. 610
9½ oz.



LIBBEY SAFEDGE GLASSWARE
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ordered from the Government Printing Office, Washington 25, D.C., for 45 cents each.

Other U.S.D.A. Publications. "Potatoes—Facts for Consumer Education" is the seventh and newest in the U.S.D.A.'s series on individuals foods, designed to provide source material for workers in extension, consumer education, and marketing services; teachers; dietitians; nutritionists; food editors; and others concerned with giving food information to consumers. It carries the number AIB 178. This booklet covers nutritive value of potatoes, home care and storage, preparation and cooking for family meals, marketing information, such as grading, varieties, packaging, and so on. Eight of the leading varieties of potatoes are illustrated. A bibliography completes the booklet. Copies may be ordered from the Government Printing Office, Washington 25, D.C., for 25 cents each.

Also released by the U.S.D.A. is Leaflet No. 438 on "Trichinosis." This six-page leaflet tells in brief form how trichinosis affects human beings and hogs, and what the consumer and the farmer can do to protect himself and his hogs from infestation. The U.S.D.A.'s Office of Information will be able to supply a copy on request.

In April, 1957, the U.S.D.A. sponsored a Nutrition Education Conference on the theme of increasing the effectiveness of nutrition. The *Proceedings* of this conference have been published as Miscellaneous Publication No. 745. Included are: a talk by Faith Clark, Director, Household Economics Research Division, on "Family Diets Today," with a number of graphs as illustrations; the summary of a talk on "Principles of Learning" by Robert S. Fleming, School of Education, New York University; and a recapitulation of a symposium on "Nutrition Education Problems of Different Age Groups—Pregnancy, Infancy, and Preschool; Elementary School Level; Teen-Agers; and Adults." Other parts of the program which are reported include a paper by John Cassel, School of Public Health, University of North Carolina, on "The Social and Cultural Implications of Food and Food Habits," and a demonstration by J. Neil Raudabaugh and Loretta V. Cowden, Federal Extension Service, U.S.D.A., on "From Idea to Action: Stages in the Social Action Process." Copies of these *Proceedings* may be requested from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

New Booklets: *TV — Learning to Use It* is the title of a report on a workshop on television training held in Toledo in April 1954 under the sponsorship of the Council of National Organizations. Three chapters deal with: "What Is Education by Television?"; "How to Plan and Produce an Educational TV Program"; and "Promoting Education by Television in Your Town." The final chapters are devoted to suggestions and details of planning a community TV workshop and information on where help may be obtained. Practical suggestions are made throughout the booklet, including: steps in program planning; pointers in building TV programs, such as script, art work, camera conduct, clearances; and so on. Copies of this booklet are on sale for 50 cents each from Room 205, The Cooper Union, Fourth Avenue at 7th Street, New York 3.

Of special interest to administrative dietitians is the new, two-color booklet prepared by American Visuals Corporation, *Dangers in the Kitchen.* The sixteen-page publication is concerned with safety in the home kitchen—although most of the principles would apply equally well to the institutional kitchen. Line drawings cover such topics as the use of knives, can openers, graters, grinders, and choppers. Other subjects include storage problems, poisons in the kitchen, and so on. A check list is provided. Copies may be ordered from the company, 460 Fourth Avenue, New York 16.

Another area of interest is covered by *Diet and Dental Health* by Ruth E.

PERFECT FOR HOTEL ROOM SERVICE
DRI-HOT PLATE
Eliminate dangerous burners, annoying smoke or fumes, and expensive service carts. These insulated stainless steel food service items will pay for themselves over and over again.
HERE IS HOW THE DRI-HOT PLATE WORKS:
• Heat the special cast alloy Dri-Hot plate disc in a 450 degree oven for 15 minutes.
• Place the heated disc in the stainless steel plate holder with handle provided.
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PLATE COVERS
Nesting style plate covers with bright finish in sizes from 7¼"—11¼".
SERVE FOODS AND BEVERAGES AT THE IDEAL TEMPERATURE
IN YOUR ROOM SERVICE OR TRAY SERVICE WITH LEGION'S STAINLESS STEEL DRI-HOT PLATE, VACUUM BEVERAGE SERVERS, INSULATED BOWL, PLATE COVERS.
PERFECT FOR HOSPITAL TRAY SERVICE
30121-VH
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VACUUM BEVERAGE SERVERS
30121-VH—10 oz. capacity
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INSULATED BOWL FOR HOT SOUP OR ICE CREAM
Legion presents as a companion piece . . . an insulated bowl which can be used for the service of hot soup; ice cream and other cold desserts. S-1151VH, size 5"x2¼". Capacity 10 oz. Specially designed dome cover prevents crushing of ice cream.
Write for catalog and name of nearest Legion Franchised Dealer.
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WHICH RICE GIVES YOU MORE SERVINGS PER POUND?

It's Uncle Ben's

NOW AT A NEW LOW PRICE!
COSTS YOU LESS THAN TWO CENTS A SERVING

the rice that cooks up fluffier . . . goes further . . . looks and tastes better even after hours on the steam table!

EXCLUSIVE PROCESS makes Uncle Ben's extra fluffy . . . each grain cooks separate and tender. REHEATS EASILY—can be kept in your refrigerator for days. Stores safely—*guaranteed* weevil-proof! NO WASTE—you serve all you cook because it doesn't gum up or stick to pans. BETTER FOR YOUR CUSTOMERS. Exclusive process seals in the vitamins and minerals of the natural rice grain. Contains *twice* the natural B vitamins of ordinary rice!

★ NEW WAYS TO SERVE RICE
Send for FREE quantity recipe cards. Write Uncle Ben's Rice, P.O. Box 1752, Houston 1, Texas.

Uncle Ben's CONVERTED® LONG GRAIN RICE

Premium Coupon In Every Package!

Tucker and Phyllis T. Brown, which is Rhode Island Agricultural Experiment Station Bulletin 340, dated June 1957. It reports a dietary study of relationships between nutrient intake, dental health, and nutritional status of seventeen children ranging in age from three to fourteen years. Write to the Rhode Island Experiment Station, Kingston, Rhode Island, if you wish a copy.

A workshop on kitchen planning was one of the activities of the Los Angeles Section of the California Dietetic Association last year (see page 100, January 1958 issue of the JOURNAL.) It consisted of twelve 2-hr. weekly sessions held last summer. The material and information presented during these meetings has now been compiled and mimeographed, with copies distributed to all those who attended. A limited number of copies are also available for those who might wish to buy them. The contents include information on: ventilation and refrigeration; salad and vegetable preparation; electrical equipment and Radarange; receiving and storage; meat and vegetable cookery; dishwashing equipment and layout; utensil washer and layout; food disposers; bakery and dessert preparation (revolving ovens); cafeteria layout and service to patients; sanitation; and legal aspects of hospital planning and evaluation of blueprints. Those who wish copies may order them from Louise K. Christensen, 801 Hilgard Avenue, Los Angeles 24, at a cost of $2 for the manual, plus sales tax where applicable, plus postage.

Errata. An error occurred in the September issue of the JOURNAL in "Do Spices Increase Acceptability of Therapeutic Diets?" by Eleanor Greig Wright, Ann M. Everson, and Doris Johnson, Ph.D. Figures in the last half of Table 6, on page 899 were incorrect. The table should have appeared as follows:

TABLE 6 Difference in spice preference between smokers and non-smokers

MEAT	NUMBER OF SUBJECTS	SPICED DAY	UNSPICED DAY	NEITHER DAY	STATISTICAL DIFFERENCE*
Smokers					
Meat loaf	10	5	2	3	0.90
Roast lamb	10	7	1	2	3.60
Spaghetti	13	4	3	6	0.08
Pork chops	13	2	5	6	0.70
Cheese fondue	4	0	1	3	0.26
Broiled fish	4	0	1	3	0.26
Hamburger	11	1	7	3	3.28
Chicken	11	0	6	5	3.28
Veal cutlet	11	4	2	5	0.36
Pot roast	11	4	2	5	0.36
Non-Smokers					
Meat loaf	18	11	5	2	2.00
Roast lamb	18	11	4	3	2.72
Spaghetti	20	13	4	3	4.06
Pork chops	20	10	4	6	1.80
Cheese fondue	7	1	3	3	0.58
Broiled fish	7	1	3	3	0.58
Hamburger	15	4	5	6	0.06
Chicken	15	4	7	4	0.60
Veal cutlet	18	4	8	6	0.88
Pot roast	18	3	8	7	1.38

* A difference of 3.84 or higher is statistically significant.

Interns Graduate. On January 29, graduation exercises were held for two dietetic interns of the *Cook County School of Nursing*, Chicago. A dinner preceded the exercises, at which Dorothy Weber Inyard, Membership and Credentials Director of A.D.A., spoke to the graduates on "Capturing Perspective." Certificates and pins were presented by Millie E. Kalsem, Director of the Dietary Department, to: Lydia G. Bartolome, Philippine Woman's University, Manila; and Peggy Lou Stover, University of Tennessee, Knoxville.

In February, five dietetic interns completed their year's work at *Henry Ford Hospital*, Detroit. Dr. Frank J. Sladen, Medical Consultant at the hospital, spoke to the graduates at a dinner in their honor in January. Diplomas, pins, and caps were presented by Margaret King, Director of Dietetics, to:

DIET KITCHEN
MEMORIAL UNIT
GRACE-NEW HAVEN
COMMUNITY HOSPITAL
NEW HAVEN, CONN.

DIRECTOR: DR. ALBERT W. SNOKE
ARCHITECT: DOUGLAS ORR, NEW HAVEN

Van helped equip hospital co-operating with Yale

★ Van is proud to have had a part in equipping for food service the Grace-New Haven Community Hospital . . . 671 patient beds and 97 bassinets . . . unit of the important medical center at New Haven.

★ Besides the diet kitchens on the five patient floors of the Memorial Unit, one of which is illustrated above, Van equipped the main kitchen which provides food for the entire hospital and all cafeterias. One of the design features is the kitchen elevator . . . running up from the main kitchen . . . serving all diet kitchens . . . ideal transportation as it is exclusively for dietary use.

★ If you have food service equipment needs . . . new or modernization . . . it will pay you to use Van's *century of experience*.

The John Van Range Co.
EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD
Branches in Principal Cities
341 EGGLESTON AVENUE CINCINNATI 2, OHIO

Therapeutic Nutrition in Chronic Disease

Meat...

and the Medically Acceptable Reducing Diet

In any medically acceptable reducing diet prescribed today, meat can serve as an important nutritional component.

Curtailment of the daily calorie allowance must not deny the patient the protein, vitamins, and minerals required for good nutritional health. Fad diets which eliminate certain basic foods can hardly be considered medically acceptable.

Calorie for calorie, no other commonly eaten food supplies the quality and quantity of protein which lean meat provides. Its B vitamins and minerals are needed daily, regardless of calorie restrictions.

Even when coexistent pathological conditions require that the calorie-reduced diet be further limited to foods low in fiber or in sodium, meat fills the same important place in each day's food allowance. The fat content of lean meat is relatively low, and meat can be prepared in various ways, as called for by almost every special diet.

In any diet which must deviate from accustomed eating habits, the taste appeal of meat makes it easier for the patient to adhere to the restrictions imposed.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago... Members Throughout the United States

Shirley Flesner, Oklahoma A. & M. College, Stillwater
Barbara Loetterle, Wittenberg College, Springfield, Ohio
Carol Kozina, Mount Mary College, Milwaukee
Luz Melinda Pauriel, University of Puerto Rico, Rio Piedras
Jacqueline Poston, Madison College, Harrisonburg, Virginia

Diets of Rural Families with Working Wives. To learn what happens to rural families' diets when the wives work, Dorothy Dickins of the Mississippi Agricultural Experiment Station surveyed 100 such families as well as 100 rural families in which the wife was a full-time homemaker. It was learned that the wives with jobs apparently feed their families as well as those who are not on a payroll. Similarities in amounts and kinds of foods used by the two groups were more striking than the differences.

The working wives, it is true, used somewhat more ready-prepared foods, such as luncheon meats, canned fish, ice cream, canned vegetables and fruits, bakery products, salad dressing, and ready-prepared soups, while the full-time homemakers spent about $3 less per week for food and served somewhat more poultry, beef, eggs, and fresh and frozen vegetables—largely home-produced. Nutritionwise, however, the diets of the two groups rated about the same.

Dr. Dickins notes that the change from home-produced to more purchased foods is slow because food habits tend to change gradually. Also, wives often are seasonal or part-time wage-earners, shifting between full-time homemaking and outside employment, so that all families are exposed to the same markets and food advertising.

Use of Salad Oils and Dressings. Data on consumption of salad oils and dressings drawn from the U.S.D.A.'s recent survey show that these foods are used most by city and suburban homes, least in farm homes. The average amount differs, too, in different parts of the country as well as with income. In the West, more salad oils and dressings are used than in other regions—which might be expected because this region also has the highest average use of fresh salad vegetables. Upper-income households use the most salad oils and dressing. In the Northeast, they used almost twice as much as the lower-income households. In the South, income made even more difference, with lower-income families using a sixth as much as the upper-income households.

ONLY WITH
Meals-on-Wheels System
DO YOU GET
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Basic Planning
Proven Equipment Design
Training Assistance
Follow-up Service
Pre-planning Tomorrow's Needs
PLUS years of research and actual field experience from the company which originated and perfected this food service.
BASIC PLANNING
Why build patient food service problems into your hospital?
Consultation with architects in planning patient food service for new or remodeled hospitals is one of the important benefits that make up the Meals-On-Wheels System. Now, during the planning stages, let specially trained Meals-On-Wheels people help in analyzing your kitchen-to-patient food service problems. An expert pilot study will show you how the complete Meals-On-Wheels System will save you money and man-hours—and still provide the one outstanding centralized tray service that delivers hot foods hot and cold foods cold to the patient's bedside. This planning help is just a part of the complete service exclusive with Meals-On-Wheels System.
Remember-"5+"is as close as your nearby representative.
Meals-on-Wheels System
DEPT. A-1, 5001 EAST 59th STREET, KANSAS CITY, MO.

News of State Associations

Alaska Dietetic Association. On December 19, Anchorage dietitians met at the home of the President, LaVerl Fehling. Nellie Wolfe, President-Elect, having attended the A.D.A. Annual Meeting in Florida, gave a detailed report of the convention. She brought back to the group a lovely rosewood gavel, the gift of the national association, which was much appreciated by the new Alaska Dietetic Association. Plans for 1958 projects were discussed. The group being small, it was decided that all will work on each project. Major emphasis will be on career guidance in the junior and senior high school, as well as community nutrition.

Arizona Dietetic Association. The fall meeting of the Arizona Dietetic Association was held December 7 in Phoenix in conjunction with the meeting of the Arizona Hospital Association. The dietetic portion of the program included:

"Let's Use All of the Dietitian's Talents"—Dorothy Taylor, Chief, Dietetic Service, VA Hospital, Tucson
"Dietetics in France and the United States"—Jessie M. Rannells, Ph.D., Head, Home Economics Department Arizona State College, Tempe
"How to Conduct a Workshop"—Mildred W. Wood, L.L.D., Director, Family Living Education, Phoenix Union High Schools and College
"Nutritional Problems in Central Nervous System Disease"—John A. Eisenbeiss, M.D., President, Mari-

for So Many Essential Nutrients..

Protein... of excellent quality

Energy... readily available

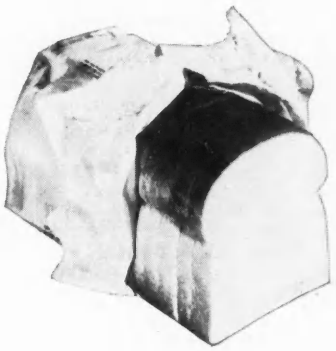
B vitamins... high in proportion to calories

Minerals... especially iron and calcium

Enriched Bread

is basic,

integral, compatible in most all diets in health and disease... regardless of dietary adjustment needed. Its fat content is minimal.



AMERICAN BAKERS ASSOCIATION
20 North Wacker Drive • Chicago 6, Illinois

copa County Medical Society, Phoenix.
"New Oral Hypoglycemic Agents—Their Role in Nutrition"—Woodson C. Young, M.D., Specialist in Internal Medicine, Phoenix
Panel discussion on "How We Can Make Nutrition Education More Effective for: Teenagers, Geriatric Patients, In-Patients, Out-Patients, and Students and Interns"

Officers of the Arizona Dietetic Association for 1957-58 are: President, Virginia L. Felch, Good Samaritan Hospital, Phoenix; President-Elect, Virginia G. Polluconi, VA Hospital, Whipple; Secretary, Gloria D. Hill, Good Samaritan Hospital, Phoenix; and Treasurer, Anne Linder, Tucson Medical Center.

Nebraska Dietetic Association. Nebraska dietitians, along with the Nebraska Hospital Association, are sponsoring a series of seven one-day cook's training schools in seven districts of the state. The first was held at Beatrice, Nebraska, on December 5, with twenty-seven in attendance. The program included discussions on normal nutrition and menu planning, as well as a question-and-answer panel on problems presented by those attending; and a round table on special uses of equipment. The other programs in the series are being held in 1958 in other areas of the state.

New Jersey Dietetic Association. In January, the New Jersey Dietetic Association inaugurated a four-meeting Food Purchasing Institute as part of its continuing education project. At the first all-day session, held on January 25, purchasing meat was the topic of discussion. At the February meeting, a lecture on canned foods and groceries was presented. Two meetings in March, on the eighth and twenty-ninth, will complete the program with spotlights on fresh and frozen fruits and vegetables and bread, eggs, and dairy products. Instructors have included representatives of the meat industry, the U.S. Department of Agriculture, a baking company, the Rutgers and Cornell Universities' faculties, and the Milk Dealers' Association of Northern New Jersey. Registrants for the course have included dietitians, home economists, school lunch personnel, and hospitals employees.

New Mexico Dietetic Association. The highlight of the winter in the New Mexico Dietetic Association has been the visit of Bessie Brooks West, former A.D.A. Continuing Education Services Director. Fifty dietitians from all over the state were present for the dinner meeting on November 12, honoring Mrs. West. The main emphasis of her talk was the importance of recruiting dietetic students. She also encouraged dietitians to participate in community nutrition activities and introduced the newest booklets released by The American Dietetic Association.

North Carolina Dietetic Association. On March 12, 13, and 14, the North Carolina Dietetic Association will cosponsor, along with the North Carolina Hospital Association and the State Board of Health, a hospital food service institute at North Carolina State College, Raleigh. The institute, the sixth of its type to be held in the state, will be directed to food service supervisors and managers in 20- to 100-bed hospitals that do not employ qualified dietitians. Theme of the meeting will be "Supervision and You." The program will include talks on: "Supervision—How We Work Through People," "Disaster Planning," and "Sanitation—Dishwashing and Care of Plastics." A panel on "Assignment of Duties" will also be a feature of the institute, as well as group discussions on menu planning and inventory control. A skit on "Setting Up Trays" and color slides on food merchandising prepared by the Food Administration Section of the North Carolina Dietetic Association will be presented.

Officers of the North Carolina Association are: President, Florence Pittman, Eastern North Carolina Sanatorium, Wilson; President-Elect, Marjorie A. Knapp, Duke University, Durham; Treasurer, Winston Osborn, Guilford County Health Department, Greensboro; and Secretary, Gwendolyn K. Farrier, North Carolina School Lunch Program, Raleigh.

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the Sponsor —The Army Medical Service, whose mission is to provide the finest care available for the Army's sick and wounded personnel. Army dietitians make a distinguished contribution to the Service by administering all phases of the Food Service Divisions in Army hospitals in this country and overseas.

the Programs —First, an AMSC-sponsored Student Dietitian Program, giving financial assistance to outstanding students majoring in Foods and Nutrition or Institution Management. You enlist in the Women's Army Corps Reserve, and remain in your school to complete your educational requirements, receiving in excess of $200 per month. At the time of graduation you are commissioned in the AMSC to take part in Dietetic Internship.

Second, an AMSC-sponsored Dietetic Internship, enabling you to qualify as a hospital dietitian without financial worry. Approved by the American Dietetic Association, this 12-month internship gives you experience in both the administrative and therapeutic phases of dietetics. The internship is conducted at Walter Reed Army Hospital, Washington, D. C., and Brooke Army Hospital, San Antonio, Texas. Upon entering the program you will be commissioned a Second Lieutenant in the AMSC, Army Reserve, and will receive $222.30 per month plus $47.88 monthly subsistence and quarters, and will enjoy the rank and prestige of an Army officer. After completing your internship, you will be assigned as a staff member in an Army hospital, working with other officers in an outstanding professional career.

the Qualifications —For the Student Dietitian Program, you must have completed either your sophomore or junior year, majoring in Foods and Nutrition or Institution Management. For the Dietetic Internship, you must have a bachelor's degree, with a major in Foods and Nutrition or in Institution Management, from an accredited college or university.

You owe it to yourself to obtain full details on these outstanding educational opportunities. Simply clip and mail this coupon today, and you will receive all the facts—at no obligation!

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Association Activities

American Association for Advancement of Science. Dorothy R. Jutton, the Association's representative on the Council of the A.A.A.S., attended the meetings of the Council held December 27 and December 30, 1957, in Indianapolis. Dr. Jutton indicated that the routine business of the Association was conducted. Of interest was a resolution recommending more general adoption of the metric system in the U.S. There was also a recommendation for more recognition of the achievements and importance of applied science as well as basic science, particularly in the fields of biology and agriculture.

Council on Documentation Research. Dr. Helen A. Hunscher represented the A.D.A. at a special meeting concerned with "A National Center for Coordination of the World's Science Information" sponsored by Western Reserve University, February 3 and 4 in Cleveland.

Nursing Education Curriculum Conferences. The Regional Curriculum Conferences for Nursing Education being sponsored by the National League for Nursing will continue through the months of March and April. The individuals representing the Association at meetings not previously listed are:

Kay Ohata, Indiana University Medical Center, Indianapolis, for the meeting in Louisville, February 26 to 28.

Sherma Johnson, Holy Cross Hospital, Salt Lake City, for the meeting in Salt Lake City, March 3 to 5.

Corinne Robinson, Drexel Institute of Technology, Philadelphia, for the meeting in Philadelphia, March 11 to 13.

Jelia Vandervort, University Hospitals, Cleveland, for the meeting in Cleveland, March 17 to 19.

Mary Kelly, Medical College of Virginia, Richmond, for the meeting in Williamsburg, Virginia, April 7 to 9.

Marjorie E. Newton, University of California School of Nursing, San Francisco, for the meeting in San Francisco, April 15 to 17.

The objectives of the conferences in part are to assist instructors in re-examining their concepts of good nursing care; to provide ideas of how faculties can plan effective learning experiences for good nursing care; and to provide impetus for schools to plan on local, state, and regional bases for improved curriculum.

National Health Forum. "Urban Sprawl and Health" will be the theme of the National Health Forum of the National Health Council to be held in Philadelphia, March 18 to 20. The Forum will focus on trends in population change and movement and the impact on governmental structures, community organizations, and family life. The goal will be to find ways in which community planners and health leaders can work together effectively in protecting and promoting the health of people in areas affected by urban sprawl. Community planning of hospitals and hospital-related services; cooperation between official and voluntary agencies in community research; and some of the new problems of community organization of voluntary health associations will be discussed.

A.D.A. Publications. Members of the Association last month received their copies of the *Annual Reports and Proceedings*, in which a number of significant activities of the Association are reported. Of special interest will be the report of the Committee to Study the Broadening of A.D.A. Membership on page 13. The list of approved dietetic internships appears in the center of the book and can be readily used for reference. On the last pages of the *Proceedings*, the history of the House of Delegates is reviewed. Reports of the activities of the Association's Sections, Boards, and Committees, as well as those of the officers, are also included.

A newly revised "Publications and Reprints" list came off the presses in February and is available on re-

Let CREAM OF RICE help solve your modified diet problems

1
EXTRA NOURISHMENT

Cream of Rice is rich in iron plus Vitamins B_1, B_2, and Niacin.

It gives quick energy fast, too. Actually within a few minutes after eating. Cream of Rice is easy to digest. Many leading pediatricians advise it.

And many doctors recommend Cream of Rice in modified diets for food allergies, ulcers, high blood pressure, intestinal distress and old-age food difficulties.

2
EASY TO FIX

Now Cream of Rice cooks in just 30 seconds. That's 10 times faster! What could be easier . . . quicker . . . less work! It's a meal in half a minute. A delicious, nourishing, easy-to-digest cereal young and old enjoy.

3
CREAMY RICE TASTE

Cream of Rice has a delicate flavor. Different, delicious. This is a creamy rice treat that really tastes good.

Guaranteed by Good Housekeeping

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FREE!
Professional Sample

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TASTES LIKE SALT

New Neocurtasal embodies the characteristic tang, grain and texture of regular table salt. Now whether food is seasoned by New Neocurtasal or salt — few patients detect the difference. Insipid dishes are rendered more palatable, tiresome diets less exacting.

When you must say "no salt," New Neocurtasal effectively cushions the blow. In selecting a most suitable replacement for salt, more and more physicians observe that New Neocurtasal assures close adherence to diet and the utmost in patient cooperation.

NEW **Neocurtasal**® — available in

"An Excellent Salt Replacement"

convenient 2 oz. shakers and 8 oz. bottles.

Contains potassium chloride, potassium glutamate, glutamic acid, calcium silicate, potassium iodide (0.01%).

When Diuresis Is a "Must"—

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Parenteral • Oral

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quest from the Headquarters office. New and recent reprints from the JOURNAL are featured, as well as other Association publications.

Obituaries

V. Marie Allwardt. The A.D.A. office has received word of the recent death of V. Marie Allwardt of Battle Creek, Michigan. Mrs. Allwardt was for seventeen years a home economics teacher in the Central High School, Battle Creek, part of that time serving as cafeteria director. She later became medical and administrative dietitian, Miami-Battle Creek Sanatorium, Miami Springs, Florida. She had been a member of the Association since 1954.

Barbara Daly Anderson. The death of Barbara Daly Anderson, for twenty years Director, Consumer Service Bureau, Parents' Institute, has been reported to the A.D.A. office. Mrs. Anderson had been an associate member of A.D.A. since 1935. She was the recipient of the Josephine Snapp Award in 1942 and was at one time President of the Advertising Women of New York.

Georgia Crane. The Association has been notified of the death on January 3 of Georgia Crane, dietitian at Palo Alto Hospital, Palo Alto, California. She had been a member of A.D.A. since 1931. She had also served on the staffs of St. Francis Hospital, San Francisco; Alta Bates Hospital, Berkeley; Presbyterian Hospital, Denver; Cleveland City Hospital; and the Latter Day Saints Hospital, Salt Lake City.

Virginia G. VanCamp. The A.D.A. office has been notified of the death in December of Virginia G. VanCamp in Phoenix. Miss VanCamp served as an Army dietitian during the war and later as dietitian at St. Joseph's Hospital, Phoenix. She has been a member of the Association since 1943.

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News of Products and Services

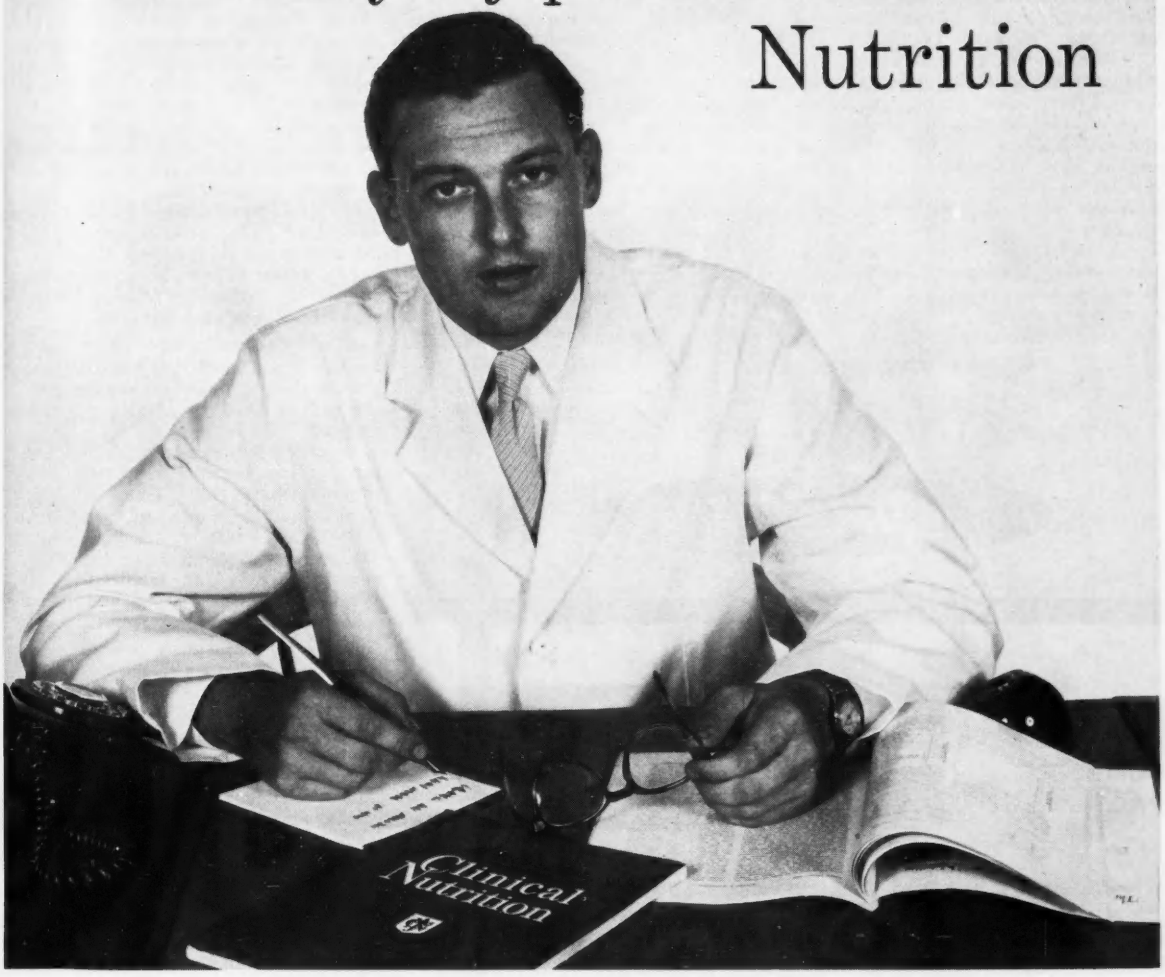
The new "Party Recipes" leaflet is a feature of Starlac's observance of the 100th Anniversary of *The Borden Company*. Starlac Crown Dessert is given the spotlight with twelve other recipes included. Source of important nutrients—protein, calcium, and riboflavin—Instant Starlac nonfat dry milk can be used as milk is used—for drinking, and in cooking and baking. Available in three sizes, the family size makes 12 qt. milk for an estimated 8 cents, the 1-lb. package 5 qt., and the pre-measured package contains three foil envelopes each making 1 qt.

The *Vulcan-Hart Manufacturing Company* announces the introduction of a complete new line of heavy-duty electric cooking equipment. It includes ranges, broilers, fryers, sectional bake and roast ovens, high shelves, spreader plates, and counter units.

The DuBois Co., Inc., has issued a new 16-mm full color and sound track motion picture, titled "Chemistry to the Rescue." Chemists' terms, such as "lime control," "emulsification," and "wetting action," are translated into understandable pictures. As part of the narration, the processing of the Cincinnati water supply from its Ohio River origin to clear, clean city water for dishwashing is traced. Similarly the action of bleaching-type chlorinated detergents to keep plastic tableware bright and attractive is shown, as well as the effect of the rinse additive and drying agent, "Dry-It," in giving fast drying and crystal brightness. The film is available for showing to groups on request from the company or through local DuBois offices.

Four new technical monographs can now be obtained by writing to *The Coffee Brewing Institute, Inc.* "Nutritional Evaluation of Coffee," (No. 24 in its Publication Series) by L. J. Teply and R. F. Prier of the Wisconsin Alumni Research Foundation, reports results of their analyses of coffee. These studies show that niacin and eight other B vitamins are found in coffee beverage along with extractable iron and calcium. "Chemistry of

today my patients ask about Nutrition



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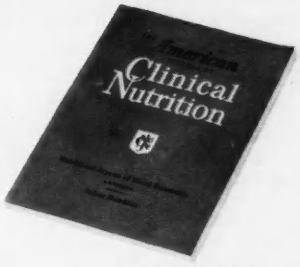

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ADA-38

Coffee" (No. 25) by Dr. Ernest Lockhart, Director, The Coffee Brewing Institute, Inc., examines the composition of the green bean, changes during and after roasting, and the beverage itself. No. 26, "Chemical Study of Coffee Flavor" by Robert L. Clements and F. E. Deatherage, The Ohio State University, reports isolation of forty acids. An important feature of this work is the analysis of the material that can be taken out of the beverage with acid. This is similar to the sediment one sees in beverage, is nitrogenous, and contains amino acids which, when heated, will break down and affect coffee flavor unfavorably. "Coffee Solubles and Beverage Acceptance," (No. 27), also prepared by Dr. Lockhart, reports that coffee quality can be controlled by a simple, practical, and useful technique known as the solids measurement test.

Cleveland Range Company has announced four new STEAM-CHEF Super-Generator-type steam cookers. The new steamers are available separately or as a combination unit with steam kettles. They are made in 2-, 3-, and 4-bu. sizes and operate either 20-, 30-, or 40-gal. direct-connected stationary or tilting-type pedestal steam kettles. Stainless or aluminum kettles may be selected.

Four new publications from the *National Live Stock and Meat Board* are of interest. The first, a forty-page booklet, "New Notes in Meat Recipes," and the second, "Variety Meats," present all sorts of enticing ideas for meat cookery. The other two are directed more to nutritional interests. "Meat Today," a folder printed in red, contains a summary of research on the nutrient content of cooked meat, with data on calorie, fat, and protein content of cooked meats from cuts currently sold with much of the fat trimmed off. "Tips for Teens" is an eight-page folder which illustrates three daily meals for "father and son" and three for "mother and daughter." The accompanying text explains in simple language the nutritional needs of teen-agers and the values of various nutrients. Snack suggestions are also included.

A new product, Lawry's Creamy French Dressing Mix, is being offered by *Van-Frank Sales Company*. It is a simple-to-prepare, self-homogenizing dressing, which is made by placing ½ c. water in a screw-top, pint-sized jar, adding the dressing mix, and shaking thoroughly. Then 2 Tbsp. vinegar and ½ c. salad oil are added, the whole is again shaken vigorously. The yield is 9 oz. or 9 servings. The mix is packaged in laminated foil, selected for its moisture and light-proof qualities.

A twenty-eight-page booklet published by *American Can Company*, *Purchase and Use of Canned Foods*, is offered as a guide for institutional buyers and meal planners. Sizes for every use are shown in table form with suggestions for the use of smaller cans when combinations are desired. Advice about using and storing canned foods is followed by an eighteen-page section of tables of "Purchase and Serving Guides," with foods listed, size of can, and approximate net weight or volume size of serving. Tables giving the estimated cost per serving are included. A guide to common can sizes appears on the last page with pictographs.

Bloomfield Industries, Inc., is offering a new cheese shaker designed to meet the problem of a shaker that will accommodate all types of cheeses from finely powdered types to the shredded and grated types. A stainless steel shaker top that is slotted rather than pierced permits the passage of long, thin cheese strands and powdered cheese. Slots are narrow enough to restrict the flow so that it can be controlled. The lower part of the shaker is made of hard-fired, crystal clear glass that is fluted for safer, surer handling. The wide mouth of the glass portion insures easy cleaning and filling. Capacity of the shaker is 4 oz.

Lakeside Mfg. Co. stainless steel utility pans are now available. Designed for use with utility carts and trucks, the distinguishing feature of this new-type utility pan is the rounded "cove" corners. As a result of this design, there are no sharp

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V-10 Protein is a balanced combination of wheat germ, the aleurone layer of the wheat kernel, and defatted soy flour, forming a complete protein.** This delicate balance results in a good-tasting quality protein supplement used in nutritionally important quantities in the baking of V-10 Protein bread and graham crackers. The improved protein efficiency of these foods gives them greater value as a source of protein in the diet.

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**Prier, R. F., and Derse, P. H.: Nutritive value of a vegetable protein mixture. *J. Am. Dietet. An.* 33:1034, 1957

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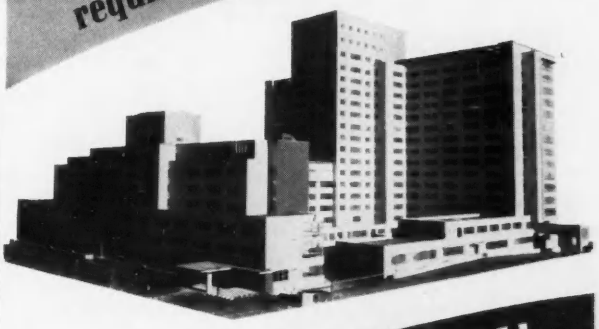

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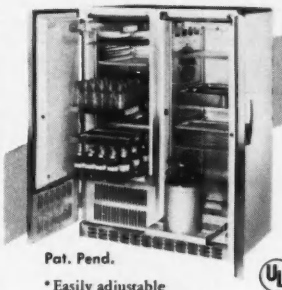

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Mercury Dietary System

The simple, natural, efficient system that assures the specified menu for every patient. Can be operated by any employee . . . frees nurses for full-time nursing duties . . . gives dietitian complete control over makeup of trays. Serves food accurately — hot, palatable, FAST! MERCURY CONTROL results in less waste . . tremendous saving in food requirements.

- Simple to load — meals dished up complete and tray checked for accuracy before leaving the kitchen.
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Illustrated: "Junior-22 Deluxe" with optional self-contained refrigeration unit.

- Most sanitary on the market; everything inside closed cabinets; slides easily removable for washing in dishwasher.
- Ruggedly built by manufacturer with 23 years experience in the heavy gauge kitchen equipment industry. Mercury "stands the gaff".
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edges to mar the tops of utility carts, trucks, counters, or tables. The entire pan can be kept perfectly clean because there are no edges or crevices where soil can accumulate. Two sizes, 21 by 14⅜ by 5 in. and 24 by 16¾ by 5 in., are priced the same as the previous Lakeside square-corner pans.

A new chicken product, Chicken Au Gratin, is being introduced to the institutional market by *Suter's Foods, Inc.* Made of cooked boned chicken blended in a rich cream sauce with aged Wisconsin Cheddar, New York Herkimer, and Parmesan cheese, the new product is packed in 50-oz. tins, six to a shipping case. Each tin will make ten to fifteen servings. It is suggested that this ready-prepared chicken dish be served over toast points, English muffins, noodle nests, rice, chow mein noodles, mashed potatoes, noodles, or bread.

Food machine stands for holding bench food mixers, weighing scales, meat choppers, slicing machines, and other kitchen equipment are now offered by *Universal Industries.* The stand is constructed of galvanized steel and features adjustable leveling feet to compensate for uneven spots in floors, which may be removed if desired and casters inserted. Available in three different basic sizes, the dimensions are: tops—20 by 24 in., 20 by 32 in., 24 by 32 in.; heights—21, 30, or 24 in.

Based on the Iowa University Breakfast Studies, *Cereal Institute, Inc.*, has announced a new, full-color 34-frame filmstrip, "Why Eat a Good Breakfast?" The filmstrip shows how the tests were conducted and recorded. Classroom discussions with students as they were shown the storyboards and slides helped in the development of this teaching tool. Prints are available to junior and senior high schools for use in home economics, health education, and science classes, and are placed on a permanent loan basis to schools' film libraries.

"Food Service in the Modern Hospital" is the title of a new brochure from *Samuel Olson Mfg. Company, Inc.*, manufacturer of subveyors and conveyors. The booklet presents data on equipment needed for hospitals of various sizes, layout suggestions, and serving schedules. Suggestions for arrangements of equipment in three sizes of hospitals are given, including tray make-up functions and dishwashing. Floor layouts, sharp illustrations, and tables help to make the booklet more useful.

Merck & Co., Inc., has announced that it will install two rice pre-mix plants in Formosa which will make use of a new enriching process developed by Merck. The process produces a rice premix under the brand name Mermix, which is white rice covered with thiamine, riboflavin, niacin, and iron. One lb. of the premix is sufficient to fortify 199 lb. vitamin-deficient white rice with the level of vitamins and iron recommended for Formosa by the Interdepartmental Committee

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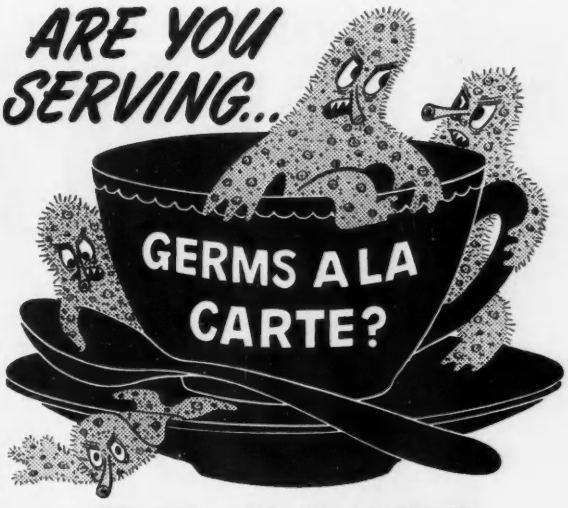

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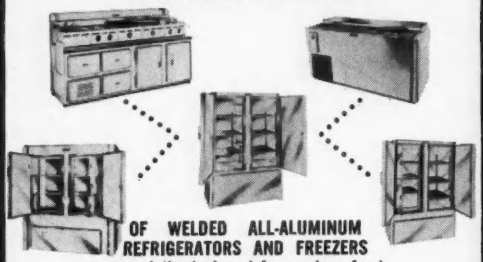

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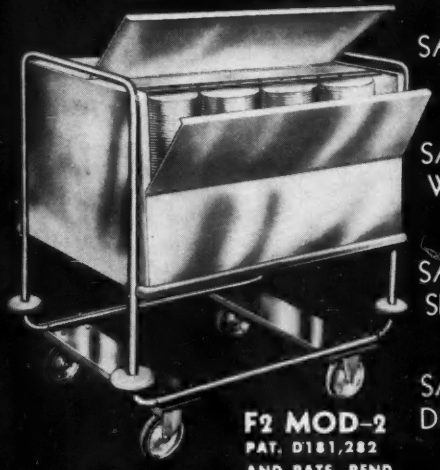

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on Nutrition for National Defense. Output of these plants will be used to enrich rice for the Chinese Nationalist Army on Formosa.

Also from *Merck & Co., Inc.*, comes a new and colorful booklet, *Enriched*, which defines flour enrichment, and discusses the uses of enriched flour and bread. Tables present the Recommended Dietary Allowances and comparative food values for various foods. It was developed for use as a teaching aid, as is a four-color poster, "What's for Lunch?" which is designed around the four food groups—bread and cereals; meat; fruits and vegetables; and milk. Four attractive luncheon trays illustrate the use of these food groups. Emphasis is, of course, on enriched bread.

A new brand of orange juice concentrate known as "Dispenser-Pak" and a new institutional dispenser serving individual portions of orange juice has been introduced by *Pasco Packing Company*. The concentrate is stored in a refrigerated chamber in the dispenser, and each serving is automatically mixed with a measured amount of water and aerated. The orange juice is packaged in a 46-oz. can. Once the can's contents are emptied into the dispenser, all operations are automatic. The dispenser holds enough concentrate for approximately 100 6-oz. servings of juice. The dispenser has no pumps or agitators and no moving parts. A dual refrigeration system handles the concentrate and chills in-coming water. The unit is operated with the touch of a button.

A new "Lucky 7" Oven, a small revolving oven, is now available from *Middleby-Marshall Oven Co.* All seven trays revolve and take standard 18 by 26 in. pans. A double suspension system is incorporated—trays supported on both ends and hung on double reels to carry heaviest loads. Trays are removable.

A new Wear-Ever aluminum iced tea dispenser has been introduced by *The Aluminum Cooking Utensil Co., Inc.* Available in either gold or silver finish, a new anodizing process provides extra hard, smooth, and easy-to-clean surfaces which resist stain and preserve the true flavor and color of the beverage. Capacity is for 2 gal. with an over-all height of less than 20 in. Clearance under the Sieling Faucet is 5½ in.

The Aluminum Cooking Utensil Co., Inc., is also offering new vinyl-aluminum Beauti-Trays by Wear-Ever. They are available in five different sizes (three rectangular and two oval) and in two popular finishes, gray linen and sun tan. Bottoms are in contrasting coral linen and British brown. Permanently bonded to aluminum, the vinyl will not fade or discolor and can be washed in dishwashers. Built for extra long service, the finish will not warp, crack, scratch, or peel, and is stain-resistant to acids, alcohols, and spotting. Because they are quiet, their use can effect a reduc-

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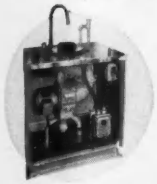
for every need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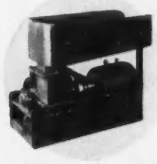
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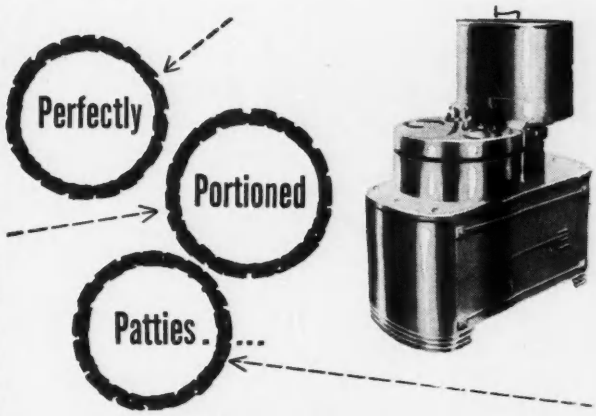

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Automatic works its wonders on fish cakes, crab cakes, hash cakes and potato patties too! A cinch to clean and maintain, your low-cost Automatic Food Shaper virtually pays for itself in the first year of operation!

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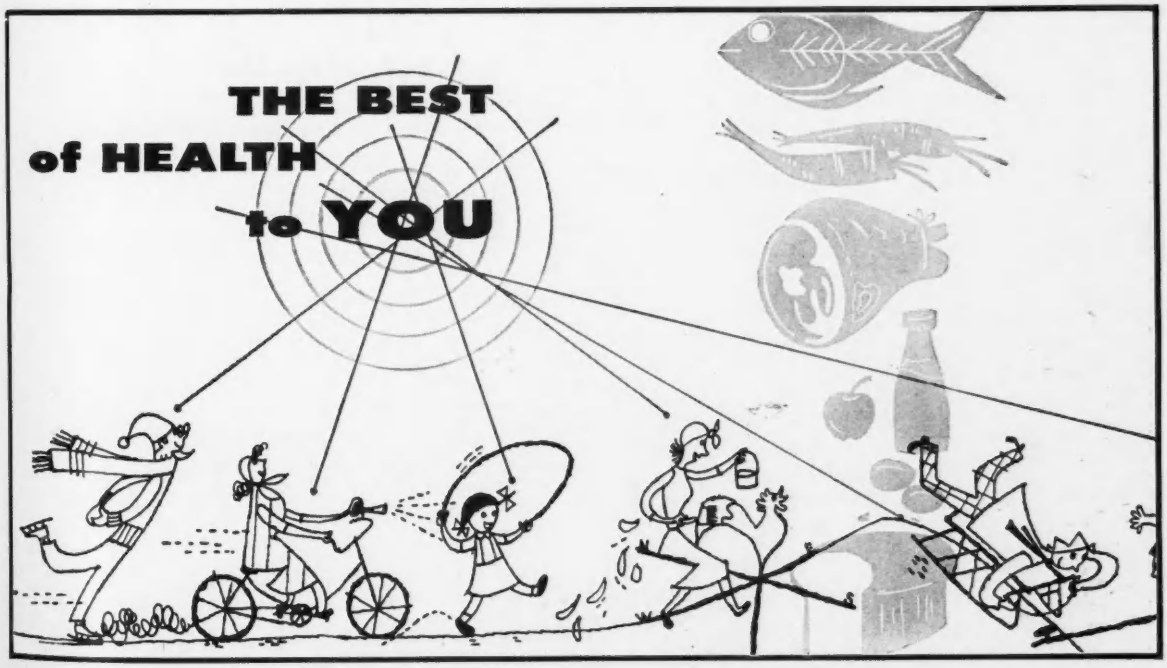

A MODEST PROPOSAL

We've said it before—and we'll say it again, "Once you try *Jullicum* it will be your friend for life." What is *Jullicum* and why are we so sure you'll like it?

It's simply this—*Jullicum* is *the* liquid rennet dessert. No, rennet desserts are not new, but *Jullicum* is new and different because it is liquid. That means it is predissolved, so that the rennet enzyme goes into action instantly. No waiting for lazy powders to dissolve. And because *Jullicum* is liquid, its flavor and color combine smoothly and thoroughly with milk to create delicious, nourishing desserts and flavored milk drinks.

But most important is *Jullicum's* RENNET ENZYME ACTION which aids the digestion of milk. This secret ingredient, *rennet* makes *Jullicum* the perfect healthful dessert for kids from 1 to 100.

Not only good for you but *Jullicum* is good tasting, too! It comes in a variety of flavors designed to appeal to the most finnicky taste:

Vanilla	Black Raspberry
Coffee	Lime
Strawberry	Almond
Orange	Caramel
Lemon	Peppermint

Certainly a dessert that is as good as all that must be expensive? Heavens, no! You'll be amazed to find that a pint bottle of *Jullicum* makes 128 full 4 ounce custard servings and costs only $1.50. About a penny a serving!

Our modest proposal is this—just try a sample bottle (makes 8 servings) at our expense. Fill out the coupon below and we'll send you a free sample and more information about *Jullicum.*

For those of you who have already sampled and discovered *Jullicum's* goodness—order some today by mail.

O.K.?

JULLICUM
5717 Christian Street
Philadelphia 43, Pa.

Gentlemen:
Please send me a free sample of Jullicum.

My favorite flavor is .....

Print Name.....

Hospital, School, or Institution.....

Address .....

City..... State.....

tion in noise in cafeterias and restaurants.

From the *Processed Apples Institute, Inc.,* comes a new set of seventeen quantity recipes. The gambit runs from sauces through "apple pork Oriental" to desserts. They are printed for mounting on 5 by 8 in. cards. Also from the Processed Apples Institute, Inc., is a new booklet, "Happy Apple Prize Recipes" which features sixty-eight of the most popular household-size recipes of hundreds developed by the Institute. Included are entrées, stuffings, relishes, salads, cookies, cakes, pies, and other deserts and specialties. Background information on the apple industry and a shopper's guide are also included.

The *Cereal Institute* and the *American Dairy Association* will join hands again next month in sponsoring the Cereal and Milk Spring Festival, April 7 through 12.

An amazing new, high-speed, electric French fry cutter that cuts 52 lb. potatoes per minute, over 3000 lb. per hour, has been announced by *Universal Industries.* This machine, Model FC, allows savings on wastage by its fast production of uniformly shaped, clean-edged French fries. You just feed potatoes into the feed pan. They are automatically lowered into position before cutting. The cutting die is available in three different size square cuts to give ⅜-, ½-, or ⅝-in. thick French fries. Both the cutting die and the plunger are easily removable for cleaning. This cutter may be used for a variety of other vegetable cutting, such as carrots and turnips. Dicing may be performed by simply refeeding the outflow back through the machine a second time.

Klenzade Products, Inc., is introducing a completely new line of food service brushes including brushes for vats and kettles, drain valves, pots and pans, small orifices, and combination brush and scrapers for efficient oven cleaning. These new brushes feature materials entirely new to the food service industries. An outstanding improvement is the new "Sponge Action"® fill which holds up to 50 per cent more cleaning solution than conventional brushes. Regular tufts of white crimped Du Pont "Tynex" nylon are interspersed with fine nylon filaments which greatly increase solution-holding capacity. Another Klenzade innovation is the new white "Bi-Nu"® special composition block which is proof against chipping and splitting and impervious to cleaning chemicals and hot water.

New quantity recipes have been prepared for the *California Prune Advisory Board* by Flanley and Woodward. Each is printed on one side of the sheet so that the recipe can be mounted on 5 by 8 in. cards. Accompanying the set of eleven recipes is an "Institutional Buying Guide" and a sheet on "Preparation Methods for Maximum 'Plumping' of Prunes."

CRAMORES CRYSTALS
are ideal for institutional use, providing consistent year-round top quality real fruit flavor—at half the price.

★ *Easy to use and store—no spoilage—no squeezing*
★ *Economical—you always have just the right amount on hand*

CRAMORES CRYSTALS
made from a base of pure, dehydrated citrus fruit juices with fruit components added to enhance flavor and body—are available in lemon-lime and orange.

CRAMORE FRUIT PRODUCTS, INC.
Point Pleasant Beach, N. J.
The Home of "Big Sea Day"

EATING IS FUN— for Older People, Too

Designed to Aid Proprietors of Small Nursing Homes and Residences. Also Adaptable to Home Kitchens

This attractive booklet is a guide to better food and food service in the small institution. Based on normal nutritional requirements for adults, the menu patterns, sample suppers, and pointers on meal planning have their place in any household. Practical ideas for making the work of the manager easier and pleasanter include a weekly marketing guide, hints for economy in buying and storage, and suggestions for serving.

This is a project of the Diet Therapy Section of The American Dietetic Association.

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Ten copies 3.75

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